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THE

PHOTOGRAPHIC NEWS:

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A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME XX.

EDITED BY G. WHARTON SIMPSON, M.A., F.S.A.

Nulla recordanti lux est ingrata.—MARTIAL.

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PREFACE.

SOMEWHAT less than twenty years ago was issued the first number of the Photographic News, the first weekly journal devoted to photography. The step was at that time believed by many to be a hazardous adventure. Photography was supposed to be not sufficiently mature, photographers not sufficiently interested in photographic literature, to render such an enterprise successful. It is true that photographic journalism was then in its feeble infancy, and that since then many journals devoted to the art have been born, and are dead and forgotten; but the Photographic News having at once made good its claims to the suffrages of photographers, and supplied the wants it was issued to meet, has steadily gone forward, yearly acquiring a deeper and a firmer position in the regard and confidence, as well as in the number, of its friends and readers. In writing the Preface to its Twentieth Volume we look back on its progress, and regard its present healthy and stable position, with very profound thankfulness and satisfaction.

The aims with which we began remain the same, although much extended and developed in application. At the outset we announced our aim to be the guide and instructor of the beginner, the medium of communication and interchange of ideas between more advanced students, and the recorder of all improvements and discoveries which may take place in the art or in the allied sciences. This position, and something more, we believe we have succeeded in filling. We have, we believe, had the satisfaction of initiating and stimulating, as well as chronicling, progress. We have endeavoured to aid the research of the investigator, as well as to record its results; to enforce art-culture amongst photographers, as well as afford materials in aid of such culture ; to uphold the scientific status ; and to consider and maintain its interest, and those of its votaries, whether regarded as an art, a science, or an industry. The task of watching the progress, in its every phase, of the art throughout the world, and publishing a sufficient record; of gathering, weighing, selecting, estimating and rejecting, discussing, condemning, approving, and preserving the facts, suggestions, modifications, and improvements which present themselves from time to time for consideration, is not a light one; but we are sustained in it by the hearty co-operation of many hundreds of correspondents and contributors, and by the confidence and approval we have had in the past from thousands of readers. We have nothing to add beyond saying that we shall not willingly fall short of the past. We will walk by the same rule, and mind the same things; and in all respects make our journal worthy at once of the confidence and of the aid it has hitherto so bountifully received.

Thanking the large circle of contributors, correspondents, and readers we have met in our pages in the past, and hoping to meet them not less satisfactorily in the future, we conclude by wishing every one of them a successful and happy New Year.

January, 1877.

The Photographic News, January 7, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Eggs and Dried Albumen—Keep your Album Locked.

Eggs and dried albumen.—Photographers are well aware of the enormous quantity of eggs employed in the fabrication of albumenized paper, the demand for this purpose having a very marked influence upon the egg market. No other industry, probably, although egg-albumen is much used in the arts and manufactures, absorbs so many eggs annually to carry it on as the albumenizing of paper, and thus it is a matter of interest to us to learn something of the Board of Trade returns respecting our egg supply. The value of eggs imported into this country during eleven months of the year reaches no less a sum that £2,426,806, we are informed; and if the eggs are estimated at six shillings per hundred, this amount represents 800,000,000 eggs. Most of our eggs, it appears, come from the Continent, and are supplied by the farmers and peasantry of France, Germany, and Austria, who, however, suffer considerable loss from breakage and decay, a large quantity of wholesome food being wasted by reason of the time that must necessarily elapse before the consumer obtains the produce. The preparation of dried albumen, to which we recently called attention, is gradually making way, and, according to the Board of Trade, it is anticipated that we shall soon obtain a larger and cheaper supply of egg-substances, suitable both for food and for industrial purposes. The firm of Effner and Co., at Passau, on the Danube, which we mentioned in these columns some time ago, is proceeding with the work in a most extensive manner. The albumen appears to be dried while the egg is in a whole state, only carefully selected ones being employed; and when the eggs are perfectly desiccated, they are reduced to a fine meal, and packed in tins ready for use. This mixed albumen is that employed for ordinary domestic purposes; but as the photographer desires the white of the egg only, whether for albumenizing paper or for employment in the preparation of plates, large quantities of the white of egg are dried for these special purposes, as also for other industrial trades in which white of egg is constantly employed. The dried white of egg fetches a higher price than the ordinary mixed albumen, as particular care has to be taken in its preparation. Fortunately for the manufacturers, there is a brisk demand for the dried yolk also by pastry-cooks and others, so that no loss is involved from the separation of the two kinds of albumen. Professor Pettenkofer has recently issued a report on dried albumen, and according to this gentleman the egg substance loses none of its valuable properties by being dried; chemical analysis shows no change beyond the absence of moisture, while as food, we are assured, it is quite equal to fresh eggs. So favourable is the report, indeed, that we hear the German military authorities are about to adopt dried egg as an item of army rations, and it bids fair to take an honourable place beside the famous pea-sausage which stood the German troops in such good stead during the last war.

Keep your albums locked.—It is now some years since photographic albums were introduced with lock and key. When we first noticed this novel idea, it did not strike us as a very brilliant one; and, indeed, the closing of one's album so fast and firm seemed, to tell the truth, rather superfluous. But we have gradually altered this opinion, and as one's big album, which contained a numerous and carefully selected collection of portraits, has by degrees become dirtier and dirtier, the idea of having it safe under lock and key has evidenced itself more than once as being a very sound one indeed. For it is not the owner of the album who spoils its pages; it is generally the dirty fingers of the domestics and their friends, who are never tired of thumbing the family album.—"This is missis, in that new yellow gown of hers; and this is missis again when she was a young 'un.—This is a picture of that gent. what comes here very often, wearing a red tie, and a short pipe; you know, him as gave me half-a-crown one Sunday, that I bought a parasol with.—Oh! ain't I grand? Here's master in his long ulster, smoking a cigar.—And this," &c. One can well imagine the conversation that goes on as the leaves of one's album are turned over, and now and then a portrait is pulled out and pushed in again, to see what it is that is written underneath. You yourself have been very careful with that album, for it contains selections, from previous books, of your best friends, probably, and your best photographs. You leave it on the table, as it is a handsome book and a present from a friend, but you never let the children have it without you are by to see it is properly taken care of. And yet, as we have said, with all your precautions the leaves become soiled, and the portraits thumbed and marked. We have heard, too, of other injuries inflicted on albums when the owner is not at hand, and this, too, not by servants, but by acquaintances. We allude to the abstraction now and then of a portrait, of which you possibly may have promised a copy, or which the visitor is sure you really do not care for, at any rate as much as he does. Pilferings of this kind may only happen but seldom, but that they do occur from time to time is a well-known fact, and in this case a lock would at once help matters, and prevent people carrying away portraits which they have abstracted from absence of mind, or any other cause. A good album, well filled, is a valuable addition to one's personal goods and chattels, and no one knows this better than the emigrant or the wanderer. In the midst of friends and acquaintances we may hold our family album very cheap, but should a time come when we have to change our place of abode, or, sadder still, when, as we advance in years, our friends depart from us one by one, then we often love, if somewhat regretfully, to turn to the familiar faces, and, pondering over their features, we try to console ourselves for the times that have gone. It is at a time like this that we appreciate most of all the photographic album, and that we wax indignant to find the carefully collected portraits soiled and injured. Many people, we know, regard the collection as a plaything or picture-book, and of course there is no harm in having albums that may be so considered upon the drawing-room table; but if one has taken trouble in getting together portraits for something more than this, then it is a little vexing to find our particular album maltreated. For this reason it is that we have of late looked with much favour upon albums that can be closed and locked by their owners, and thus kept out of harm's way from the prying and the mischievous.

FRENCH CORRESPONDENCE.

Resume of the Year—Carbon Printing and M. Lambert—The Photochromic Establishments on the Quai Voltaire—Dry-Plate Processes—The Society at Toulouse—New Books—Ducos du Hauron's Experiments.

We think that in commencing the new year, 1876, it will be of interest to glance back at the past twelvemonth, and make a resumé of the most important works which have been made known in the domain of our art. As a matter of course we intend confining ourselves simply to what has taken place in France.

The first thing that strikes the retrospective eye is the great stride onwards which has taken place in the newer methods of photographic printing, in carbon printing, in printing with greasy ink, and in photo-chromic printing. It may be said that since the commencement of 1875, all these processes have become eminently practical, but in order that they may be taken up (so prejudiced, unfortunately, are people with us for things that be), it is always necessary to make the advantages of any novelties very prominent before they are recognised.

Without desiring to enter into any sort of discussion, and without prejudging in any way the questions of priority raised in respect to certain patents, it is impossible not to recognise the fact that this revolution, so useful to all of us, is due principally to the efforts of M. Lambert. Whether the method of printing which he has propagated belongs to him or not, and whether he has fostered this improvement in carbon printing from commercial motives, or from a desire that the art may progress in the interest of all, are, after all, unimportant questions. What is very certain is, that he obtains with the utmost certainty very fine results, proving in the clearest manner possible that the means he employs are successful, and thus forcing, as it were, his brethren to essay them, and share with him their advantages. At this moment, thanks to him, carbon photography is gradually penetrating into the studio, and on seeing the excellent pictures they obtain, and which they can deliver to their customers with an assurance that such productions are permanent, photographers hardly understand how it is that they have been so long hesitating to adopt the process.

The methods of printing by means of fatty ink have also made a step in advance. Everybody admired, at the last Brussels Exhibition, and at the Maritime Exhibition in Paris, the magnificent productions from the studio of M. Thiel, ainé. M. Geymet has worked out his own process, and, besides the laboratory where he pursues his researches in the domain of chemistry, he has fitted up a printing establishment which is actively at work. The large establishments of MM. Goupil et Lemercier produce continually a large quantity of photo-glyptic prints, which serve to illustrate many books and theatrical journals. But the great event of the year is certainly the practical exploitation of photochromy.

I announced some months ago the installation of M. Leon Vidal in the office of the *Societie des Publications Periodiques*, which is a publishing company under the direction of M. Dulloz. During the very first weeks of this association, the directors, fully comprehending the multitude of applications of which the process was capable in its modified and improved form, did not hesitate to make ample arrangements for its introduction into the works. At the present moment it may be said that the establishment of photochromy on the Quai Voltaire is in full working order. The staff of artists, of photographic assistants, of printers, and other employés of both sexes, number more than fifty persons. The establishment has its own photographic gallery, and laboratories for the preparation of the pigment tissue and the colouring materials employed; it has its own presses, steam-engines for large work—for other printing processes have been added to that of photochromy—its own offices, store, and show rooms, photochromic prints being now articles of commerce. We may best give an idea of the establishment by stating that every day there are produced more than forty thousand pictures of various kinds.

Already six of the principal photographic portraitists of Paris are in direct connection with the photochromic works. They furnish clichés, of which impressions in colours are produced for them, and all are in astonishment at the results which are furnished to them, the price of which does not amount to half what would have to be paid to a painter to apply water or oil colours. The female portraits produced are especially fine, for photochromy gives a transparency of tone which the brush of the most skilful artist cannot imitate; nothing, indeed, but a process such as this could render the delicate modelling of a feminine expression, or the fine details of an elegant toilet with the gradations of shadow upon it, such as light produces.

We always find M. Leon Vidal at his office, constantly surrounded by a crowd of busybodies, artists, publishers, editors, &c., attracted by the desire to be the first to profit by the beautiful invention. Nothing can convey an idea of their surprise on seeing these marvellous pictures; and the demand made for the productions is becoming so large that very soon the establishment, which I have described, will be quite unequal to the supply.

The dry plate process, or processes rather, have made no material progress this year in France; but, as I believe I announced a little while ago, two competitions have been organized with a view to promote active research in this direction, the one under the auspices of the Society, the other proposed by M. Liebert. It may therefore be hoped that the year 1876 will see some important improvement in this direction.

We have stated that for some months past a photographic society has existed at Toulouse, which publishes a monthly *Bulletin*. This new association has made its debut by announcing a competition, a good commencement, which augurs well for its future.

Beyond a pamphlet by M. Klary upon a new system of lighting, *La Retouche Photographique*, by a Specialist; and the History of Carbon Printing, by Dr. D. van Monckhoven, no new work has appeared this year; but we have had several new editions of old works, notably the *Insucces* of M. Cordier, an excellent practical volume, which merits all the success it has obtained.

M. Ducos du Hauron has published recently a new memoire which I have analysed in my correspondence; but, so far as practical matters are concerned, this ingenious experimenter seems to have made little progress. Let us hope that he may be more successful during the year which has just commenced.

There is no need to remind the readers of this journal of the great service which has been rendered by photography to astronomical science during the year 1875, for the Photographic News has supplied full details on the subject. In conclusion, therefore, we may say that the year that has passed has been a beneficial one, so far as our art is concerned. Ernest Lacan.

SEASONABLE REMARKS CONCERNING PHOTOGRAPHY.

BY W. T. BOVEY.

Taking advantage of the present holiday season, when sentiment, retrospect, and prophecy harmoniously blend with new year's enjoyments, I purpose reviewing, in brief, the past, present, and future of the art of photography, whose history and prospects, as they recall to the above indicated three tenses, are surrounded with features of interest which, although often described, have not yet failed of material for further discourse.

Concerning the past. Photographic annals can be summarised in a very few words, inasmuch as the fact is perfectly familiar, to all who have expended thought on the matter, that for a lengthened period, extending over several years, photography was enabled to record a brilliant series of triumphs which the civilized world gazed upon with feelings of admiration, mingled with wonder and, in some respects, awe. Time, however, has cut short the gallop of progress, and, as far as new processes are concerned, photography assumes at the present a distinct inclination to pause, and the question is suggested by that circumstance, whether danger exists of a speedy and permanent full stop.

The events of the past year provide unmistakeable evidence that something is wanting to impart new energy into the field, or, failing of this desired momentum, the art must dejectedly sink into a dull round of duties, and command no greater an amount of enthusiasm from its practitioners than is bestowed on mechanical trades. To enable an accurate judgment to be formed of the position now held by photography, no better test can be chosen than the exhibition held in the latter months of last year; and, if the test herein advocated affords a reliable criterion, conspicuous testimony has confirmed the fact that the highest class of exhibitors no longer labour to promote the general weal. The reasons which induced our foremost men to quit the ranks of exhibitors are, however, clearly obvious, if we take into consideration those limitations which dwarf, or convert into caricature, attempts at imaginative art which every photographer possessing ambition, knowledge, and taste, has at some time hopefully indulged in. As long as discriminating workers were able to produce positive examples of improvement, they strenuously laboured to present some pictorial novelty for inspection every year. But with the non-elastic materials at present placed in their hands, the most able have reached the extremes of possible progression, and, having no new thing to show, they are content to rest on old laurels, rather than run a risk by plodding in an exhausted field. Hence the absence of familiar names from the last exhibition should be regarded as a warning which, noted in time, will occasion new plans to be formed with a view of resuscitating declining interest, and importing a fresh flow of vigour among those who are desponding because they have conquered the whole known world of their art.

To bring about so desirable a change in these (at present) sombre prospects, the Parent Society must render assistance, and boldly step in; and although it might appear somewhat humiliating to borrow its *modus operandi* from others, a valuable hint might nevertheless be gleaned from examples provided by our American brothers and cousins. Unhappily, no serious attempt has in England ever been made to weld photographic interests together. Each photographer exists an isolated unit, working alone, as a rule, with but few opportunities of seeing or knowing one another. Our American *confreres* discovered a similar defect in their social machinery a long time ago, and, with characteristic sagacity, they set themselves to work to provide a practical remedy, which assumed the attractive form of an annual congress, wherein photographers, resident in every compass point of the Union, assemble to compar notes and take part in discussions on multifarious matters affecting their art and the trade. Now, seeing that English photographers of any note visit the metropolis, as a rule, at least once a year, why should not advantage be taken of our exhibitions, by making of them a localised point for the holding of a series of meetings, at which papers might be read, processes practically demonstrated, and general questions relating to photography (commercial and otherwise) discussed and unitedly dealt with? To a limited extent the South London Society has undertaken this work; but its operations have no stimulative status, nor are they sufficiently extensive to tempt our country cousins to time their visits to town with a view of taking part in the proceedings. An odd one or so might incidentally step in; but exceptions are accidental, and my remarks are based on the rule. The executive of the South London Society merit a large meed of praise for the intelligent and enterprising spirit they exhibit in this and all other matters with which they so energetically deal; but to work out the idea of a congress to perfection, the Photographic Society of Great Britain must throw overboard its ludicrous preference for swallow-tail coats, and, heart and soul, work out a bold, broad, and cosmopolitan scheme, inviting all to its annual show, and attracting them thither by proffered opportunities of joining their counsel together. Under such conditions our exhibitions would constitute a focus for friendly and instructive reunion, and a healthful infusion of fresh vigour so established would keep the art up to its highest standard during all coming years.

As regards the falling-off of the number of highest-class pictures exhibited, that defect can only be remedied by making some provisions for remunerating exhibitors, who, hitherto, have cheerfully worked without pay. Medals have been tried, and have turned out great failures, creators of jealousies, distrust, working little good, and a vast deal of harm. And I see no way out of the prevailing difficulty except in the Art Union system, which, adopted, would enable exhibitors of meritorious pictures to dispose of their works at remunerative prices, which none have hitherto been able to do. I dealt with this matter exhaustively on a former occasion, and time has unfolded new arguments in support of my views. What is wanted to keep our exhibitions up to the highest attainable standard of excellence is. a wholesome incentive, possessing sufficient attractions to allure our best men, who require some new impetus to awaken their slumbering zeal; and if that motive force is tardy in entering its appearance, exhibitions might perhaps prolong for a year or two a languid existence, but inanition must ultimately set in, and they will die of apathetic neglect.

ON PHOTOGRAPHING CHILDREN.

BY GEORGE HOOPER.

It is an acknowledged fact that young children make the prettiest pictures, and the quicker the exposure and the more careless the pose, the better the result. Many things have been tried to amuse and attract, such as dolls, dogs, cats, monkeys, flowers, birds, biscuits, buns, &c., and, in order to carry out the old idea of a bird coming out of the camera, I have frequently used the "American mocking bird," but as this has to be swung round at the end of a long string, it takes up too much room, and is not a little dangerous, as it might break glass, and unless held correctly finishes up by giving you a crack on the head, generally in the neighbourhood of the temples.

There are various ways of treating young children. My advice is, if you have a very lively child to deal with, the less you do the better; simply watch your opportunity. If you have a sleepy one, try and frighten it; but if you have a crying or fretful one, be lively and attract by sound; also the same for dull, heavy children, with fat cheeks, full eyes, and no features. A whistle that can be easily concealed in the mouth, and that will give a good shrill blast, is a capital thing. However, I would just mention that on one occasion when I was very anxious to secure a certain young gentleman in a particularly favourable pose, I bit the whistle in half, and almost swallowed the other half, which, considering it was made of a mixture of tin and lead, might not have proved very digestible. If some enterprising dealer will make some neat little mouth whistles in gutta-percha, they would prove very acceptable to operators.

Another dodge I tried was to fasten a cord to the studio bell and connect it with the foot, so as to be able to ring it at any moment. This, however, was not altogether successful, as the baby looks all over the place to find the bell; but even this has been the means of securing some good profile poses, of course with almost instantaneous exposures. What I now wish to advocate, after some experience, is the use of what I have termed a permanent gong. I keep it close to the camera, and the moment the shutter is lifted the gong sends forth a musical sound of very considerable strength—in fact, sufficient to make a dull baby look lively; a peevish, fretful one, stare and even laugh; and keep a tired one from going off to sleep. It is very simple, as it only needs to be pressed quietly, and away it goes as long as you can desire. When it has run out, it only needs to be wound up, and it is again ready for use. One other advantage of this little toy is that, instead of calling out to your assistant for the plate (as if it was meal time, and perhaps very tantalizing to a sitter, who has probably waited so long for her turn that she is contemplating either an overcooked dinner or one half cold), you need simply touch the gong, and the plate immediately jumps out of the negative-bath with the dark slide. Try it! Try it!! Try it!!!

WANDERING THOUGHTS.

BY A LITTLE PHOTO.

Would it not be as well if some provincial photographers took up my suggestion of last year to hold local exhibitions? Nothing has been done that way yet. Everybody does not see the London one, and, as I said before, it would improve the status of the profession, as the public would see that the men who produced these things were not fools.

The Status of Photographers.—How are we to elevate ourselves, when some men who are comparatively in good positions will lower us by advertising like quacks or mountebanks? A. advertises that his pictures are superb, and his enlargements are done by his new permanent process that won the prize medal at last year's exhibition—meaning autotypes (not giving honour where honour is due); B. that portraits in oil look like blocks of wood beside his productions; and another, that he has been invited to meet the photographers of the town at the Liquor-up Hotel, to give instructions as to how he makes his beautiful cartes. They think it clever, but the public laugh and sneer at them. The public in the main are not such fools, and judge by your works, but still look upon the whole profession as a community of quacks, and give no credit to the operator—think it's the machine that does it. Time and patience may cure this!

Presses.—Would it not be a good press, made on the principle of the laundress's crimping machine, viz., a hot iron to go in the bottom roller?—if in nickel silver all the better. Some photographers have no gas, and spirit lamps are too much trouble; besides, a plate does not produce the effect.

Retouching.—Sometimes, by grit in the pencil or heavy hand, you are apt to make a scratch. If you rub your finger over the sandpaper you sharpen your pencil on, and then pass it lightly over the damaged part, it will generally fill it up, so that it will require no after-touching on the print.

Printers.—Would it not be as well if printers looked better at the negatives as a whole than merely as a piece of paper to turn a certain colour? I have known them go on printing a whole day with a small bit knocked out of the hand, or a scratch on some part, and never see it until the spotter-out has shown it them. Black spots cannot be well stopped. See to this, my friends, next year.

Copyright.—Would it not be a good thing for the profession to band together and get a fund, to agitate so as to get an Act of Parliament for the protection of original photographs—something simple, such as putting on the mount "The right of reproduction is reserved"? We are now a power in the State, and if Parliament will pass laws for Bank clerks, surely it will for photographers—if pressed.

Carbon Printing.—Is it a good idea to suggest that some firm take a number of young men and teach them carbon printing, and, when perfect, turn them out to provincial photographers, so that it would become popular? Many who now print in silver would gladly take an extra hand whom they knew was up to his work; but they cannot combine the two in one man. Messrs. S., S., B. & Co.! make a note of this.

The Benevolent Association.—Might I suggest to the assistants generally, ladies and gentlemen, that they should give better support to the above than they, as I have reason to believe, have hitherto done, and the small men in business on their own account, and employers in general? There are many mishaps that our usual funds, Oddfellows' and Foresters' clubs, &c., do not cover, in which this association is ready and willing to lend a helping hand. If you are out of work, but in health, the benefit societies give nothing; and some men are ruined by having their small stock consumed by fire; then the P. B. A. will try and give you a lift again. There are good men and true connected with it who only work for the general welfare without fee or reward, so that in the future year I trust there will be a large increase of members and donations.

ARE PRINTING AND TONING IMPROVING WITH OTHER BRANCHES OF OUR ART?

BY C. E. W.

This is a question that I fear seldom, if ever, suggests itself to the practical notice of those gentlemen who deal with the many improvements of the photographic world—one that often occupies my thoughts while perusing the pages of the Photographic News and other of our journals. We read of patents granted and improvements made in almost every other conceivable branch. Yet, having arrived at a certain standard with regard to what I consider one of the most important branches of photography, there we seem to stick, contenting ourselves with passably satisfactory results. Granted there are grand improvements in certain classes of printing valuable to many, and equally good in their respective ways; but is the plain silver paper printing doing credit to us who are working hard to establish a name? Is there not sufficient scope for improvement in this as in any other branch? How many photographers leave the printing and toning in the hands of their assistants, while they devote their time to the production of some new process, by which means they can introduce some novel enlargement or impart some delicacy or artistic touch to their negatives—things also necessary in our days. But what avails the operator in striving to obtain a perfect negative if the after manipulation is deficient? We think that it too often happens that men calling themselves professed printers content themselves with the old "routine" of work, as long as they can produce results that will pass muster, never thinking that in these enlightened days we must be up and doing, and endeavour as far as possible to tempt the artistic eye with something more pleasing than a black-and-white three-quarter somebody on a smartly decorated card.

Loss of gold, heavy, flat pictures, have driven the desponding photographer to seek relief in another course of working rather than devote a little time in solving the mystery surrounding his favourite toning bath. Time, he says, will not permit him diving into the world of experiment. If this is really the case, there is sure to be a helping hand held out in some quarter to pull him through his difficulties. Whatever may have been his toning formulas, permit me, *en passant*, to suggest one, the working of which I can with confidence place in your hands; one, perhaps, not altogether new to some, but so arranged that I have been working one prepared thus for now over eighteen months, toning in the summer months from 1,000 to 1,200 prints per day. This may seem a quantity to many, but with this number I can always depend upon the most pleasing results. I have tested, thoroughly and practically, I may say almost every variety of toning bath, and, like my brother workers, I have had my failures; but being in a position to devote a little time to study, and being interested particularly in this branch of photography, I may say I have been amply rewarded in my efforts. Time will not permit me giving a lengthened account of the preparation of the silvered paper; indeed, it is so well known, that it is not deemed necessary. I would just suggest the advisability of not over-floating the paper, keeping the silver solution up to its strength, and to thoroughly dry the paper before placing it in the printing frames, as any dampness is apt to cockle it up, especially in large pictures. Wash all the free silver well out, and prepare to tone in the following bath:—

Boiled water	30 ozs.
Crystallized acetate of soda ...	2 „
Chloride of gold	15 grs.
Carbonate of soda	10 „
Citrate of soda	(a few grains if the purple tone is required.)

When the crystals are thoroughly dissolved, add the carbonate of soda and filter, after which add the gold. This bath should be made a few days before it is used. The longer it is left to ripen the more beautiful the results. During the cold winter months the bath may advantageously be heated to a temperature of 100° Fahr. In a bottle containing about 20 ounces of water, dissolve 2 ounces of acetate of soda and two 15-grain tubes of gold. Shake the whole well together, and keep as strong stock solution. When the day's work is finished add from this solution about 4 ounces, or in quantity as the bath gets reduced. This of course is left to the operator's judgment. Any quantity of this solution may with safety be added to the bath just before or during the process of toning.

The whole is simple and effective. To those who have not yet tried it I would urge them to give it a trial, whether amateur or professional. As one great source of failure is acidity, I would recommend keeping at hand a bottle containing a solution of carbonate of soda and water. As it is now almost universally known that the silver print upon its removal from the printing frame has to a certain extent an acid reaction, so the addition of a little carbonate solution added to the bath every now and then, acts beneficially in neutralizing it. I would also advise placing the prints in a pan containing a little salt on their removal from the toning bath. As in a quantity this directly stops the toning action, and prevents the paper from blistering, as some papers are apt to do when in the fixing solution. This is better done in a rather weak solution of hyposulphite of soda, keeping them in the bath a little longer than with a stronger bath. It is less likely to injure the half tones.

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THE ACTION OF PRESERVATIVES ON BROMIDE OF SILVER PLATES.

BY PROFESSOR H. VOGEL.*

It is a well-known fact that certain bodies, such as morphine, tannin, gallic acid, yellow prussiate of potash, nitrate of silver, &c., augment very materially the sensitiveness of iodide of silver. Nitrate of silver acts more vigorously than any other of the sensitizers, a circumstance which was pointed out by me ten years ago. It would seem natural that the same bodies would exercise similarly favourable influence upon bromide of silver, although we have no very accurate evidence upon the subject. Lea has, however, published the results of some experiments (1874), and these showed that the favourable action was questionable. He experimented with films or coatings of pyroxlin, glycerine, resin, and tannin, and found that the last-named body had the effect of diminishing the sensitiveness, while the others were without any action at all. Some experiments undertaken during the past year, with dry plates of different kinds, led me to inquire into the subject, and to examine the action of other sensitizers upon bromide of silver.

I first tried morphine, which has the effect of rendering both iodide and iodo-bromide of silver more sensitive. When pure bromide of silver was experimented with, there was, singularly enough, no action observable, or rather the morphine plates proved rather less sensitive than those of pure bromide of silver. Morphine plates, after being prepared for some days, proved to be materially less sensitive than pure bromide of silver.

An application of pyrogallic acid gave a similar result with bromide of silver; it did not act in any way when fresh, while it sensitizes iodide of silver very materially. As besides pyrogallic acid, gallic acid, gum and albumen are all employed as preservatives for dry plates, I resolved also to test the action of these. I did so with the following results:—

Gallic acid in the form of a 1 per cent. aqueous solution, applied to a plate and dried, diminished the sensitiveness of bromide of silver in a very marked degree.

Gum in the form of a 2 per cent. aqueous solution gave a similar result. In both cases, however, the coated plates proved clearer and cleaner than the uncoated plates.

Albumen I tested as in the Fothergill process:—

a.—Albumen	25 cubic cents.
Water	14 "
Ammonia	5 drops.

The above was shaken and filtered.

b.—Water	100 cubic cents.
Nitrate of silver	6 grammes.

The solution *a* was treated with ammonia until no more precipitate was formed, and then 25 cubic centimetres of the liquid were added to 25 cubic cents. of *b*, and the bromide plates coated with the mixture and dried.

Result.—The albumen plates proved much less sensitive than the pure bromide films. By way of comparison, nitrate of silver was tried in a wet state. A plate, half covered with it, showed much greater sensitiveness upon the coated half than the uncoated.

Further, the albumen solution was washed off after its application to the plate, and the latter then dried; in this case the albumenized plates showed themselves much more sensitive than the non-albumenized.

Bromide of potassium, in the form of a one per cent. aqueous solution, was applied to a bromide plate, and after remaining thereon for five minutes, washed off again and the film dried. In this case the plate appeared considerably less sensitive than those not treated with bromide of potassium. The action of the potassium salt was not, however, by far so injurious as the action of iodide of potassium upon iodide of silver.

Finally, tannin was employed in the form of a 2 per cent. aqueous solution; in this case also the tanno-bromide plates proved to be much less sensitive than the pure bromide films, although the tannin plates were cleaner.

Very remarkable, however, was the difficulty experienced in fixing the tannin plates, while the pure bromide films were fixed almost instantaneously by means of concentrated hyposulphate of soda solution; the tannin films required to be treated with the same liquid for something like a quarter of an hour before the whole of the bromide was dissolved away. This was the more remarkable from the circumstance that the plates, before development, had been washed first with alcohol and then with water. This circumstance caused me to consider whether the unfavourable action of the tannin was not due to the fact that the penetration of the chemicals was thereby rendered more difficult.

For this reason I tried to effect the complete removal of the tannin before development by washing the plate repeatedly with alcohol. The pure bromide plates which were afterwards to compare were treated in a similar manner, and both were then developed in the same way. The tannin plates under these circumstances showed in the higher lights a much greater intensity than the pure bromide films, and on treatment with hyposulphite of soda they fixed with equal rapidity.

This experiment throws a light upon many phenomena. Till now it has been generally assumed that the preservative in dry plates performed the function among others of maintaining the pores of the film open, so that its impregnation by liquids may be facilitated. Tannin, one of the principal preservatives, exhibits in respect to bromide plates the very reverse of this famous quality. Further, the experiment shows that the apparently diminished sensitiveness of the tanno-bromide plates is only to be ascribed to the circumstance that the tannin materially interferes with the impregnation of the film by the developer, which in all these cases, I may mention, was alkaline in character.

In regard to exposure, tannin acts as an accelerator. How far other preservatives interfere with the action of the developer, further experiments will teach us. It is very likely that they exert considerable influence upon bromide of silver plates.

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* *Photographische Mittheilungen.*

The Photographic News.

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THE PAST YEAR.

The year eighteen hundred and seventy-five has been one of more activity in experimental branches of photography than many preceding years. Without being marked by actual discovery or much specific novelty, it has been a year of definite progress in several directions, the progress being exhibited rather in expansion in the capacity of various processes, and extension of application, than in change of any kind in the general practice of the art.

In portraiture, which to professional photographers is the most important branch of the art, there has not been much actual change. Early in the year Mr. Blanchard introduced to the attention of photographers a new size, for which he believed there was an opening, and Messrs. Marion announced mounts, albums, and other material facilities for the satisfactory introduction of the pictures to the public. The new picture, styled the "Boudoir Portrait," was practically a carte-de-visite on a large scale, being, in fact, just four times the ordinary card size, and, of course, of the same proportions and style of mounting. Some discussion as to the fitness of these proportions arose at the time, the argument of convenience being, however, strongly in its favour. The style was adopted with avidity by some, but, so far as we know, it has not met with general acceptance. Mr. Abel Lewis introduced some admirable examples of portraiture, under the name of "Imperial Portraits." This consisted of a whole-plate picture, mounted with narrow margin like a card portrait. The style, which was undoubtedly effective, has not, we believe, been extensively adopted. In America, also, the idea of the necessity or desirability of a new style seems to have been entertained, and the "Promenade Portrait" has been introduced; but how far it has been received with general favour is uncertain. The proportions of the promenade portrait exaggerate the objections alleged against the boudoir portrait, in being still taller in proportion to width, and therefore "lankier," to use the phrase employed by one able critic in pleading for a modification of the boudoir proportions. The promenade portrait is seven inches by four, and, like the card, mounted with a narrow margin. Some of the examples we have seen are very effective, but in the majority there is a tendency to dwarf the figure by the large amount of space overhead, to which the great length of the picture gives a tendency. The style of portraiture in which a large proportion of the head and figure is kept in half shadow, and designated the "Rembrandt" style, has continued in vogue, but with less tendency to bizarre extravagance. The practice of enamelling the surface with gelatine and collodion still prevails extensively. The adoption of the oval medallion form for the portrait, with a margin printed in flat tint, or with a delicate diaper, is also common. An odd practice in connection with this margin is at times adopted: the junction of the tinted margin with the oval of the portrait is wilfully made imperfect, so as to show a line of white on one side. The effect is always odd, and often very offensive.

Retouching is still almost universally practised, and whilst the result generally secures the approval of the public, it is to be feared that its practice, even to the excessive degree now common, will continue. Of the advantage and legitimacy of judicious retouching, to ameliorate accidental blemishes or defects incidental to photography, there cannot be a reasonable doubt; but nothing can be more deplorable than the practice so common of reducing every condition of complexion and texture of skin to one smooth, lineless, characterless surface, most resembling stone, or, if retaining any resemblance of flesh, presenting universally the soft skin of youth. It is unfortunate that the unconscious vanity of human nature is gratified by the sacrifice of truth, and the portraitist finds his account in pandering to the taste for such sophisticated portraiture. This practice has seriously modified the position of many portraitists. Before its universal adoption, accomplished photographers of artistic culture, who, by judicious arrangement of light and shade, selection of position and treatment, and skilful manipulation, produced the most pleasing portraits, and best concealed the defects incident to their art or their model, took the highest rank and secured the highest success. Skilful and excessive retouching has tended to reduce almost all degrees of skill in photography to one level. At present there is little prospect of a reform in this direction.

In the materials and processes of the portraitist there is very little change. The nitrate bath, its diseases and remedies, form constant themes for discussion; but no especially new thing, no definite change in relation to it, has been adopted. The iron developer remains much the same. The addition of a methyl compound to it, as worked out by Herr Warnerke, appears to possess advantages. Dr. Van Monckhoven's developer for permitting shorter exposure has not come much into use, some uncertainty in its operations having been alleged to exist. Acetate of iron is said to have played an important part in its constitution.

Enlarging processes have continued to receive attention, and a very high standard of technical excellence has been attained. The plan of making an enlarged negative from a transparency is now almost universal, and a general conviction prevails that the use of carbon tissue for the transparency is of great advantage. The revival of the plan of using paper negatives for enlargements which we proposed some years ago has received considerable attention during the year. Mr. Blanchard, who had worked the matter out independently, read a paper on the subject before the Photographic Society, and showed some results which demonstrated the great advantages to be gained. An interesting paper on the subject by Mr. Wm. Brooks, who had also worked the matter out independently, appeared in our pages, as well as a paper on masking, which is legitimately connected with the paper negative system. Some very fine enlargements were shown at the Society's Exhibition, by a method which Captain Abney has devised, and finds very valuable. It consists in making an enlarged transparency, and reproducing the negative by contact printing upon a dry plate. M. Lambert's system of enlarging has been largely adopted during the year. Its introduction commercially was inaugurated by some bitter controversy, which, as is customary with such controversies, effected nothing, beyond confirming the disputants each in his own view. Happily, with unimportant exceptions, the acrimony engendered on such occasions is soon forgotten.

In silver printing there is little if any change, beyond, perhaps, a steadily growing distrust of its possible permanency, and a conviction that, instead of approaching more nearly to a standard of stability, the albumenized prints at present produced are more liable to change than were those printed a dozen years ago. This does not appear to be an uncommon opinion, and it deserves grave consideration. Carbon printing appears to be making steady strides, both as regards perfection of result, facility of production, and adoption by photographers. The production by Mr. Sawyer of a developing support with an elastic surface, removed one frequent defect in results. The introduction of various ingenious facilities by Mons. Lambert, and his skilful demonstrations, also gave a great impetus to the adoption of the process. To what extent it is now generally adopted amongst photographers we cannot say, but that it is gradually growing in favour there cannot be a doubt. In the establishment at Ryde of Mr. Jabez Hughes and his son it has entirely superseded silver printing for every purpose. The powder carbon process, which last year attracted considerable attention as a means of reproducing or modifying negatives, has come into favourable notice as an artistic method of printing, some singularly fine examples having been shown by Mr. Faulkner at the last Photographic Exhibition.

Photo-mechanical printing processes are progressing. The collographic processes are advancing in excellence of result and in extent of application. The principle of the photo-relief printing process—the patent of which, as specified by Mr. Woodbury, has run out—appears to be adopted by others, and will probably come into general practice. Photo-lithography has not made very important strides, nor have photo-engraving or photo-block-printing processes.

Dry processes have occupied considerable attention during the year, and emulsion processes especially have gained ground. The plan of washing the emulsions for the purpose of removing soluble salt, first adopted, we believe, by Mr. Kennett in the preparation of his sensitive pellicle, has been found valuable in emulsions of bromide and iodide of silver, and also in the collodio-chloride of silver emulsion, where it is required for printing on glass. The gelatine pellicle, as prepared by Mr. Kennett, has been progressing in favour, its great sensitiveness being an important element in its value. The old dry processes, in which the nitrate bath is employed, still retain their position amongst many photographers; the coffee process and the beer process, as described by Captain Abney in our pages, having many successful advocates.

The ingenious attempt of Herr Warnerke to produce a sensitive tissue without glass plates, for use either in portions of the required size, or in continuous lengths upon rollers in the camera, promises to be a practical success, and, we trust, a commercial one, as it deserves to be.

Photographic Societies have been, on the whole, active and successful. The Photographic Society of Great Britain has been free this year from the discord which, a year or two ago, produced unhappy disruption; but the former tone of cordial harmony, and the spirit of concord and cohesion, have not yet been recovered. The South London Society has made a valuable and successful feature of its annual technical exhibition, which is regarded with the deepest interest by hundreds of photographers, who come from all parts of the country to be present. The exhibition held by the Photographic Society was so far financially successful that it paid all expenses, and was attended by a large number of visitors. The general quality of the pictures was not in advance of former years, and many of the most important exhibitors of former years were not represented.

A year of uncertain weather has been unfavourable for landscape photography, and professional photography in portraiture has, from the same cause, been generally dull during the year.

Death has been unusually busy amongst the ranks of men known in photography. O. G. Reglander, Thomas Sutton, John Atkinson, John Watkin, the Rev. J. G. Cowan, F. R. Window, and Mr. Boucher, are some amongst the men for ever lost to the art.

EDUCATION OF PHOTOGRAPHERS.

Gradually the introduction of lectures on photography is being made in the educational establishment of Germany, and we are glad to hear that the Polytechnic School at Pesth has followed the example of Berlin and Dresden, and appointed a lecturer on photography. In Berlin, as most of our readers know, Professor Hermann Vogel occupies a chair at the Royal Industrial College, and both delivers lectures upon the art-science and gives demonstrations of it in a properly constructed photographic laboratory. Dr. Vogel's lectures are exceedingly well attended, and a few years ago the authorities recognised that gentleman's efforts by promoting him from the post of lecturer to that of Professor. In Dresden, at the Polytechnic School, there is also a lecturer on photography, and endeavours are being made to introduce instruction in photography at the public schools Aix-la-Chapelle, Karlsruhe, and Stuttgard, although, so far, without success.

The Hungarian Polytechnic School at Pesth has, however, been more fortunate, and the Professor of Chemistry at that institution, Dr. Wartha, has now undertaken a course of lectures upon the theory and application of photography, while practical demonstrations in the art are given in a suitable laboratory. The step has been very successful, for no less than thirty-five students have attended the lectures, and the popularity of the movement is therefore beyond question.

We should be glad to see the example followed in our higher schools and colleges, for there are many who would be only too delighted to obtain in this way some instruction in our beautiful art.

Critical Notices.

OLD ENGLISH HOMES: A Summer's Sketch Book. By Stephen Thompson. (London: Sampson Low, Marston, Low, and Searle.)

In the volume before us, of which Mr. Stephen Thompson is author and photographer, it becomes a question of some difficulty to which to give preference, the admirably-selected and skilfully-photographed illustrations, or the literary pages, in which description and history so pleasantly recall the past, and depict the present, aspect of many of the finest of the "free, fair homes of England," which, as *homes*, are probably the finest in the world. Here are half a dozen of these homes described, and illustrated from various points by upwards of twenty fine photographs. The scenery belongs to most charming parts of the southern counties of England, and each home is not only famous in history, but is full of associations with poetry and art. The task of tracing the records of these histories and associations has manifestly been a labour of love with Mr. Thompson, and he has given to each story a living glow and picturesque vitality which possess a singular charm, the text illustrating the artistic tendency of the writer's mind as aptly as it is shown in the photographs. Amongst the latter are some very admirably chosen views of fine subjects, the season of the year selected for each picture possessing a subtle harmony with the subject. In the majority of instances the Woodbury process, by which the illustrations are produced, has rendered fair justice to the negative; but in some few instances, from its innate shortcomings or lack of care in the printing, the prints are not perfectly satisfactory. The idea of presenting pictures of the historic homes of England, in which the poetry and romance of their inner life are blended with their relations to national history, with copious photographic illustrations, is a very happy one, and we hope Mr. Thompson will continue the work. Knole and Penshurst, and Hever, and Stoke Poges, and Ightham, and Hamden House are full of interest, but there are many more homes in England not less worthy of the same skilful and loving treatment, and we shall hope to see a succession of volumes as handsome and complete as that now before us.

LETTS' DIARIES FOR 1876. (London: Letts and Sons, Limited.)

Letts' Diaries are so well known all over the world for their completeness of information, for their variety and convenience, that a reminder of their issue for the New Year is scarcely necessary. Every possible necessity to which diary or almanac can administer is met by some of the varieties issued by this firm. We especially commend to photographers as a ready means, and furnishing a temptation, for roughly noting down memoranda of experiences, however trifling, the Rough Diary or Scribbling Journal, of which an example is before us. Besides a calendar, and a vast variety of information on points of daily-recurring interest, here are a series of foolscap pages ruled and dated, and interleaved with blotting-paper. The pages invite filling, and everything being ready at hand, no effort is required to make the jottings, which may afterwards prove of much value and interest.

STUDIES OF NATURE (No. V.). By Stephen Thompson. (London: Sampson Low, Marston, Searle, and Rivington.)

We have already noticed the earlier numbers of this serial. The present is a capital example of its excellence. The photograph of a picturesque ivy-clad doorway at Hatfield House, with a pretty little boy sitting on the steps, is very good. The print of the Foreland, North Devon, is, however a conspicuous example of an imperfection in the photo-mechanical printing adopted.

THE PHOTOGRAPHERS' POCKET ALMANAC, 1876. (Southport: D. H. Cussons.)

Mr. Cussons' little almanac is this year illustrated with a couple of card portraits by a permanent printing process, which will interest photographers; they are especially intended to show the value of certain accessories. As a pocket almanac it will be useful to all photographers.

THE GARDEN: A Weekly Illustrated Journal of Gardening in all its Branches. (London: Southampton Street, Covent Garden.

One of the most enterprising attempts in connection with the illustration of journals has just been made by the proprietor of our horticulturial contemporary *The Garden*. It consists in the issue every week of a very handsome coloured illustration of print or flower, on a sheet of fine plate-paper, the full size of the journal. The example before us, a handful of the Great St. Bruno's Lily, nature size, is admirably perfect in drawing and colour. To those of our readers interested in gardening, we can recommend *The Garden* as a journal well worthy of their attention, full of matter of general horticultural interest, and of detailed technical information. The illustration each week we should regard as worth more than the cost of the journal.

THE LONDON AND PROVINCIAL ILLUSTRATED NEWSPAPER: 166, Strand.

This is a new and very formidable competitor for the established illustrated journals, issued at a cheaper rate, whilst fairly rivalling them in quality. The pictures are capital, and the literary portion of the journal bids fair to exceed in excellence that of any of the existing illustrated journals.

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PHOTOGRAPHY IN GERMANY.

BY J. R. SAWYER.

Having lately visited Berlin with a view of introducing the autotype process of printing in permanent pigments, it may not be uninteresting to your numerous readers if I place before them some notes of what I saw in Germany, and some points that struck me as being novel to our experience in England.

I left Paris by the Chemin de fer du Nord one evening at eight o'clock, and, travelling *via* Cologne and Hanover, arrived at Berlin the next evening at seven o'clock, thus being a railway journey of twenty-three hours. The train waits at Cologne for more than an hour, and as the time of arrival there is eight o'clock in the morning, breakfast and a good wash are both desirable and attainable. The traveller is also allowed half-an-hour for dinner (and a very good dinner too) at a place I have forgotten the name of, and so, upon the whole, the journey is not unpleasant nor particularly fatiguing.

I soon find myself ensconced in the Hotel de Magdeburg, which for comfort, quiet, and attention, may be equalled, but cannot be easily surpassed.

Berlin is a city in which, as it always appears to me, civilization and barbarism jostle each other. Palaces and hovels in juxta-position, wide straight streets, with the most peculiar drainage, fine buildings, handsome shops and houses looking upon the most wretchedly paved roadways—pavements so bad that a ride in a second-class droschky is a species of torture which can scarcely be conceived. The Germans are peculiar, and their capital is a very fair type of the present transition stage of the people.

I had arranged to instruct a class consisting of fourteen of the principal photographers of Berlin, and with all of these gentlemen I was happy to be on the most friendly terms. I found them men of talent, artistic feeling, and education; most of them spoke three languages, and all of them evinced a real interest in whatever was new and likely to prove of use to them in their profession. Among them was one name very well known in England—Professor Vogel. Never having seen the Professor, I was imagining what he would be like, picturing to myself the typical German professor, smoky, grave, spectacled. Judge my surprise to be introduced to a quick, active, energetic man of about eight-and-thirty, full of life and go; spoke English nearly as well as I did; been about everywhere; with lots of general knowledge, and with a heartiness of welcome that was very agreeable.

I had opportunities of visiting the studios and ateliers of many of my pupils in autotype, but I did not observe anything very different to our arrangements at home; in fact, photographers' places are all very much alike all over the world, I suspect.

Most of the studios have a high side light, which comes down very nearly to the floor, with a skylight, meeting it at the top. The system of lighting seems to be, to begin with darkness—that is, with all the curtains drawn—then posing the subject, undrawing blind after blind till the proper effect of light and shade is obtained, using small, light stands carrying blue or white paper screens to act as reflectors.

They are a little extravagant in the article of glass, using a very good polished sort of flattened crown, nearly as good as patent plate, with the edges nicely bevelled.

I am inclined to think that the negatives are certainly not better than those taken in England, but the system of delicate and artistic retouch applied to them enables photographs to be printed from them which will challenge and beat out and out anything done in England.

Upon this subject of retouch there will be differences of opinion, probably irreconcilable; but it appears to me that so long as the art of photography is unable to give the delicate gradations of colour as they present themselves to the eye, so long is artistic retouch on the negative justifiable and necessary. One method of retouch appeared to me to offer some advantages: in this, a solution of gum water is poured upon the negative; when dry, this is worked upon in pencil. As soon as a satisfactory result is obtained the plate is varnished, and there is the retouch safe from all accidents.

A very common method is to use a matt varnish for the back of the plate, putting the vigorous, bold work upon that, and the finest work upon the front. I have before me a negative of a sweetly beautiful child, a little underexposed, but of which the hair has been brought out, and harmony given very exquisitely by this method. The varnish may be scraped away in places to give more emphasis to portions wanting it. I believe the varnish is sometimes coloured, then the negative developed with iron, and no further intensification given; with working upon portions of this, and scraping out other portions, most charming pictures are made.

In the ateliers that came under my notice, very great care and attention were given to the washing of prints, after toning and fixing; all had automatic machines that by various methods kept emptying and filling themselves as the prints washed, with sundry ingenious contrivances to prevent their sticking together. After washing in this way for some hours the prints were each taken separately and washed in warm water with a sponge, then dried, or partially dried, between blotting paper.

I went in rather earlier than usual to the studio of my friend S——, and found him looking over the prints made the day following. With what painstaking and care he looked at every one! How jealously he put aside every one that was the least bit too light, or too dark, too high, too low, or badly vignetted. Well, I thought, that fellow must succeed; and he does succeed—turns out a run of work surprising for its fine quality, and has, in consequence, a splendid business.

If care is given to the production of the negative, at least equal care is bestowed upon the finished print. After mounting, the pictures are taken in hand by a staff of artists, who really do a good deal to them besides the mere spotting out—spend a lot of time about them to make them pleasing to their clients. When quite satisfactory they are generally burnished, done up very neatly, and present an example of artistic production, treated with conscientious skill and care from beginning to end.

I was invited to the meeting of the Photographic Society, of which Professor Vogel is president, and as its proceedings differ somewhat from the mode common amongst ourselves, it may be interesting if I give some account of what took place. The room in which the meetings are held belongs to an artists' club in Berlin, and is lent to the Photographic Society once a fortnight. It is furnished somewhat like a café with chairs and small tables; the president sits at a high desk, the members greet each other with the greatest cordiality, and the waiter is put in constant requisition for German beer, which is consumed during the proceedings in large quantity. There is a conspicuous absence of pedantry and formality, rendering it much more like a pleasant gathering of friends for giving and receiving information than anything we are accustomed to; yet, with all this, plenty of work is got through. On the occasion of my being present, the chairman commenced the proceedings by calling for the report of the committee appointed to draw up a petition to the German Parliament for granting a copyright in photographs. This was read, discussed at some length, and agreed to. Then a negative was taken of a microscopic object, illumined by the lime light, the eye-piece of the microscope being removed, and its place supplied by an ingenious and simple camera and plateholder. The negative turned out very successfully, exquisitely sharp and well defined, and was duly handed round. Then some slips of glass had been prepared for the microscope, by having pieces of carbon tissue developed upon them after exposure to light, to test the state of division of the colour. This had been done without my knowledge, and I was not sorry to find that the microscope showed that considerable improvement was manifest over similar slips prepared two years ago, and which were now shown in comparison.

Then came an exhibition of microscopic photographs in the sciopticon, and very clear, good, and interesting they were. This brought the evening to a close, and certainly an evening spent pleasantly and profitably. It was quite refreshing to see the cordiality and good feeling that existed, the desire to help forward the art, and the total absence of all rivalry, except that of doing the best work.

I have a host of pleasant memories of my Berlin friends—their kindness, their hospitality, the excellent music you get, their magnificent opera, none of which need be more than hinted at here, but which all combined to render my visit very agreeable, and cause me to remember my German friends with feelings of great esteem.

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DIFFICULTIES IN THE PHOTO-COLLOGRAPHIC PROCESS.

BY CAPTAIN WATERHOUSE, R.E.

I notice in the News for the 29th October, that a correspondent signing "W. R. P." has had some trouble in working the photo-collotype process by my formula, and asks for information. The following notes may perhaps be found useful.

The method of sensitizing the dried tanno-gelatine film in a bath of bichromate of potash is the best and most convenient. With chrome alum and other hardening substances which do not form a precipitate with bichromate of potash, the sensitizing salt may be mixed with the gelatine. The tannin films are not very sensitive, and soon lose their sensibility by keeping. With a freshly prepared plate, the exposure to light varies from twenty-five to fifty minutes in the shade under ordinary half-tone negatives, the exact time depending upon the age and sensibility of the plate, the intensity of the light, and the density of the negative. For clear line subjects about ten minutes in the sun is sufficient. For the exposure of the back of the film, five to ten minutes in the sun has not been found too much.

I have found it convenient to use an actinometer containing a graduated scale, photographed as a negative from a drawing in Indian ink, and intensified to the pitch of the negatives in ordinary use. The sensitive surface is a slip of glass coated at the same time, and with the same sensitive mixture, as the printing plates, and treated in exactly the same way. This form of actinometer, and the method of using it, will be found described at page 462, Vol. XVI., of the News.

Nelson's opaque gelatine I have always found to answer well, and, indeed, prefer it to other sorts.

The time of soaking the plates is difficult to state exactly, but I prefer to remove all traces of bichromate. The plates are somewhat hard, and require a long soaking, generally of an hour or two, and I have sometimes found them to work better on the second day than the first.

Though fairly good half-tone prints can be obtained from the plates prepared with tannin, we have generally found them better for line work than for half-tone, for which some of the other methods are better. With all, however, some little skill as a printer is required, and the peculiarities of the plates have to be studied. The ink, the roller, and the paper have all an effect in the result, and we have constantly found that films that will work with glue rollers will not work with leather, and *vice versa.* In the same manner some will print well on plain paper and not on enamelled; others, again, on enamelled and not on plain. The processes are very uncertain in their results, and require considerable working to find out the best conditions to suit local circumstances; and, though we have tried several different methods, we have not yet succeeded in finding a good process for half-tone prints that can be depended upon to yield good results all the year round in this climate. For line work the tanno-gelatine plates are excellent, and fairly regular in their working at most seasons.

ON SOME IMPROVEMENTS IN AUTOTYPE OR PIGMENT PRINTING.

BY J. R. JOHNSON.

Every person who has practised the autotype process, whether for the purpose of obtaining non-reversed prints with an ordinary or matt surface, or those with an enamel or glazed surface by the intervention of an interposed surface of collodion, as described in the Autotype Manual, must have been occasionally disappointed at finding that the pigment paper, when applied to the surface of the temporary support, failed to adhere to that support, curling up at the edges, or withdrawing within itself and becoming reticulated over its whole surface.

This arises from a modification in the nature of the gelatine forming the tissue. This modification may have arisen during the solution and preparation of the gelatine previously to forming the pigment paper, or during the drying of this paper, but more rarely after sensitizing it for use in the bath of bichromate. Such a tissue, utterly unfit for use for the double transfer process, is still admirably suited for the single transfer process, and to this fact is due a great portion of the delay which has taken place in the recognition of the merits of the former.

Formerly, if a pigment paper answered well for the single tranfer process, it was pronounced "good tissue," and if it failed in the hands of an operator practising the double transfer process, the failure was at once attributed to the unskilful manipulation, or to what was alternately called the "uncertainty" of the double process, notwithstanding its known certainty in the hands of persons who made their own pigment paper, or where, consuming a considerable amount of the article, insisted upon its supply to a known standard of quality.

Yet a little reasoning ought to have shown us that the two processes, being founded upon principles essentially different, necessarily demanded different conditions for their successful operations.

In the single transfer process, or in the double transfer process of Swan, that which M. Marion very properly calls the latent image—that is, the pellicle of gelatine, with its embedded pigment rendered more or less insoluble by light from the surface of the pigment paper—is *cemented* to the surface of the permanent support by a colloid body, albumen or insoluble gelatine, or in Swan's process by caoutchouc.

In the double transfer process the latent insoluble image only adheres by virtue of the vacuum, the exclusion of air and water due to the *suction* of soluble gelatine mass behind it, and if this, instead of a solid body perfectly insoluble in cold water, be a pasty mass, neither absolutely insoluble, nor truly porous, the condition of the power of suction no longer exists. Such a condition of the gelatine can be induced by a certain treatment of the gelatine solution, and that condition being favourable to the practice of the single transfer process was that which, by tradition, obtained at the Autotype factory, and hence the uncertainty of the double transfer process.

This state of things no longer exists. The requirements of the pigment paper for the practice of double transfer paper are fully recognized, and the power of obtaining them at will has been acquired; and it is to this power that the late great impulse in photography is really due. In vain might the distinguished commis-voyageurs who, under various fancy names more or less appropriate, are calling the attention of the photographic trade to the merits of the double transfer process, display their zeal, eloquence, and manipulative skill, unless they were backed up by the articles supplied by the Autotype Company. The process has been further improved by the introduction of two new flexible supports, one the invention of Mr. J. B. Sawyer, and the other of my friend, M. Geo. Vidal, late of Marseilles, but now of Paris, where, at the head of a large establishment, he is producing magnificent results in what he calls photo chromotype.

The novelty of these supports does not consist in the fact of their being flexible. A transparent flexible support is referred to in the original patent, and one prepared with a layer of shellac has long been sold by the Autotype Company, and a peculiar transparent flexible support has been extensively employed by M. Vidal, by means of which he effects perfect "register" in the superposition of his coloured proofs.

The real novelty and value of the two new supports, in my opinion, after careful manipulation, lie in the fact that while fulfilling the conditions of the double transfer process, imperviousness to air and repellent surface, so as to prevent alternate adhesion, they possess, nevertheless, a certain amount of the properties of the colloids employed for their prepared gelatine, in the one case, and albumen in the other. These still retain a fraction of these adhesive qualities, in spite of the layer of fatty matter added to prevent ultimate adhesion.

The flexible support of Mr. Sawyer has been fully described; that of M. Vidal is formed by immersing the very best and stoutest albumenized paper, free from gum, in saturated solution of stearic acid in alcohol, or, rather, spirit of wine, to which 5 per cent. of pine resin (gum Thus?) has been added.

It is difficult to obtain stearic acid pure, variable quantities of paraffin being mixed with it in candle making. It must therefore be bought at a dealer's in pure chemicals.

The Autotype Company have, however, prepared all three articles for sale; that is to say, an albumen paper of proper quality and strength, and a solution of the pure materials indicated.

Even an inferior paper may be worked upon these supports, and success may be obtained by them with a picture upon glass, even when collodionized, will fail.

If, however, from imperfect sensitizing and drying, or any other cause, a pigment paper be found not to adhere to the support, but slip and give reticulations as described, it may be made to work satisfactorily by covering its face, either before or after insolation, with a very weak collodion (say)

Collodion normal 1
Methylated spirit 2

A pellicle from a solution of this nature is not perfectly impervious, and in some way or other maintains free from reticulation the imperfect latent image upon the support, when it would alone and without such addition utterly fail. If the collodion be employed undiluted by the methylated spirit, it is impervious to water, and cannot be applied to the impervious support by suction; but such a prepared paper may be developed, provided it be longer than the picture required, and that its edge, or the edges of the rigid support, be coated with a band of sol. of caoutchouc, and be allowed to dry before the wetted prepared pigment paper coated with collodion be applied.

Either of these two "dodges" will render a pigment paper certain in its use.

Another simple but still important modification was made and published by M. Vidal as far back as 1870.

It consists in pouring upon the pigment proof which has been developed, washed, and alumed, and while still wet, a weak solution of gelatine, while the damp but drained proof is placed upon a levelling stand, a small quantity of gelatine solution. This fills up the depressions: enables us to work upon or retain high lights, which otherwise could not be done, in consequence of the absence of gelatine. The transfer from the support to the transfer paper is much more easily and certainly effected.

Correspondence.

A GROWL.

Sir,—Ages, like men, have their characteristics. We have times of the poets or of painters—of superstition or intellectual activity. Literature, or the spirit of war, or of religious feeling, may be in the ascendant. Progress, ever tacking about in a lop-sided fashion—crabs promenading; for even the wisest of us see too dimly what real progress is to enable us to go straight forward. So comes it that the "bee in the bonnet" of this century is the mechanical one—mechanico-materialistic we may call it, for does not wisdom dwell in big words? Of its railways, telegraphs, "*et hoc genus omne*," we speak not here, having a wholesome fear of the editorial Pandemonium before our eyes. Of these he who runs may read—write, too, if there be not books enough; but, like the frogs of old Egypt, the spirit of the times is into our kneading (bread-making) troughs; and being, if anything at all, picture-making, our picture-making must be mended, not, forsooth, by mending the maker—increasing his knowledge, skill, aptitude—but by purchase of a "process" giving him more machinery, new armour, like the old, ofttimes too big for him. No longer is the fault in us, but in our stars "that we are underlings." Ergo, shall we not alter the stars, and be happy? Men of ability may we not be, when it can be had done up in twenty pounds' worths, or what not? Buy a license, man, and, as said, "be happy." Will not licenses that cost money teach you, at least, the value of things more or less most surely known and believed among us, but, like many things otherwise well known, also well neglected? Use the prescribed material in the prescribed manner, and save the trouble of learning from the bosom of nature. Why should we be disturbed with any more tales of starving artists, reduced to a last brush, it may be, but catching glimpses erewhile of the upper glories from "attics of Tottenham Court Road," and elswhere, when pictures can be made by prescription? Records of their struggling with adversity, "heart within and God o'erhead," are they not written? We honoured them. Rest their memory, their dreamings of "divine afflatus" and "inspiration" included. But they were slow times; ours is the day of "processes," and "modes of working." Eureka! shout it, behold "the third epoch" of photography, its latter day glory, is on us—be its effulgence not altogether that of a lantern, and even its little light, alas! my masters, somewhat borrowed.

Simon Magus wanted a process of a sort, and would have paid money for it; we do pay the money, but get we always the power we think we've purchased? "Give me also" is said quickly enough, not always perhaps so speedily done.

Suppose I go to Oldman, of So-So Square, of whom I buy colours and brushes. He might oblige Growler, as an old customer, with "a written guarantee" that they're the same he sells to Mahlstick, big man, the talk of the town, whose pictures have the place of honour at the Academy; but how if Growler ventures a hint that he would like some of Mahlstick's ability sent along with the brushes—say put up in five shilling bales, triple size, twelve shillings and sixpence, will he get it?

Oh, my brothers!—licensed blockheads all of us—shall this last for ever, or have we about exhausted this task to commence some other of our lopsided crab-walking progress? One would think London, Paris, or Scaldborough invention couldn't do much more for us. Seeing this "third epoch" plan of buying the privilege of buying materials has been reached, were it not a change worth the while to try what a little "home-grown" thought and study for ourselves will do? "Many things go to make a man"—more, it may be, than giving him his "art culture" in a frill made up of dodges, however ingenious, labelled "process," and signed, sealed, and delivered to him with a "Know all men by these presents" sort of document. Maybe nature isn't yet exhausted. Some have made their works as well as lives sublime. Have we analysed those works till we've wrested from them the secret of their glamour, and seen with the eyes of those who were pre-eminently the seers of their time? There's a difference between the purchase of power and the working for it, if you think of it. We're all licenced (freely) to think, observe, and strive, and, doing so, somewhat might be the outcome.

GROWLER, SEN.

DIAGNOSIS BY MEANS OF PHOTOGRAPHY.

DEAR SIR,—In your impression for December 24th, in an article headed "Diagnosis by Means of Photography," a case of small-pox is alluded to; it has appeared several times, which, I suppose with you, to be one and the same case. I will, with your permission, relate a similar instance that has occurred in my practice; this was not a case of small-pox, but a case of cutaneous eruption of some kind. A few months since a lady called on me to ask whether the eruption then (fully) out on her face would show in a photograph if she had it taken. I examined her face in a good light, and found the rash, or breaking-out, looked very red and angry, with a bluish cast. I told her that I did not think the eruption would show, knowing myself if the blotches did show I could get rid of them by retouching; but having the blue (angry) appearance I thought the blue cast would render them invisible in the negative, or nearly so. In this surmise I was quite right: they did not show much in the negative—at least, not this crop, that were in full bloom; these extended from the bottom of the chin to half way up the cheek; but, to my great surprise, there was a similar lot visible in the negative on the other side of the face, that appeared to the sight to be quite free. I thought it very strange, and took another negative, thinking they were due to some chemical defect or manipulation. The second negative was just the same as the first, and the spots that were visible to the eye in the face of the lady showed but very little, while the lot that did photograph were differently arranged, so there could be no mistake. The existing defects were touched out, and proofs sent, but owing to the expression, which was not good, they were not liked, and another sitting agreed upon. The second sitting, as per arrangement, took place about ten or twelve days after the first. I found that the eruption that was visible on the first occasion had almost disappeared, or nearly so, so that it was not noticeable, but another series had made their appearance on the other side of the face, corresponding in arrangement to the markings alluded to in the negatives taken on the first occasion, proving, beyond a doubt to me, that it is possible to photograph an approaching disease or eruption prior to its being visible to the eye, and, I think, confirmatory with the case of small-pox mentioned by others. I therefore think it worthy of being recorded, and well worthy of the investigation of medical men for the diagnosis of approaching disease; and, probably, different diseases would give spots or markings of different shapes, that could be determined by the aid of the microscope.

I may also state, as it is related to the medical aspect of the question, that when I was in the town of Penzance, in 1868, I made a few experiments for a medical gentleman there (Dr. Barclay Montgomery) who had a little instrument for registering the beating of the pulse. It was a small instrument and was placed on the bare arm, and kept in position by two small straps, one end of an arm or lever resting on the pulse, and the other end resting lightly against a slip of smoked glass that was travelling at a given rate per minute, by clockwork arrangement, and as the pulse rose and fell the arm of the lever was moved in accordance with it, while the other end scratched the piece of smoked glass. These glasses were photographed by placing white paper behind them, and printing from the resulting negative, which gave a correct registration of the beating of the pulse in paper which could be better kept for reference than the smoked glass, which was easily injured. I don't think he ever made any use of the photographic part of the affair, owing to his large practice, and photography being out of his line, so the matter ended as far as I was concerned. I think occurrences of this kind are worthy of being recorded, as they might be the means of assisting the mission of the medical man to alleviate the sufferings of our fellow-men.—I am sir, yours respectfully, W. BROOKS.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—At the next meeting of the Society the following papers will be read:—"On some Photographic Matters," by Col. H. Stuart Wortley"; "On the Photographs of the Arctic Expedition," by H. Dixon.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The first meeting of the forthcoming session will take place on Thursday, January 13th, in the rooms of the Society of Arts, Adelphi, at half-past seven o'clock, when the evening will be devoted to an exhibition of lantern-slides by members and others. Admission free by tickets to be obtained of the Hon. Sec., 57, Queen's Road, Peckham.

DEATH OF A MILITARY PHOTOGRAPHER.—The death is announced of Sergeant-Major Shuckard, who was for some years past the chief military photographer in the War Department Photographic Establishment at Woolwich, which, as our readers are aware, is under the direction of Mr. Baden Pritchard, F.C.S The deceased photographer was a most skilful operator, and thoroughly versed in carbon printing, of which he had had many years' experience, and his loss will be much felt in the military photographic studio, where these acquirements, added to a knowledge of drawing and lithography, constituted him a most valuable public servant. Sergeant-Major Shuckard died most suddenly of disease of the heart.

EBONITE SENSITIVE TO LIGHT.—M. l'Abbé Laborde notes the fact that ebonite, amongst other substances of a non-photographic nature, is easily acted upon by light. If a piece of the material in question be partially covered with an opaque substance, and exposed for some hours to full sunshine, the portions acted upon will be found to have acquired a more or less dull appearance, the black colour being much less brilliant than the portion not acted upon. This effect M. Laborde ascribes to the presence of sulphur. We may mention, however, that india-rubber without sulphur is sensitive to light.

ELECTRIFYING COLLODION.—Few bodies are more easily electrified than collodion. With the least friction by the hand, the membrane adheres to the fingers. If a collodion sheet be fixed, like a flag, to a glass tube, and waved in dry and hot air, it is electrified. Other uses of collodion sheets, here mentioned, are in experiments on polarization of light, on colours of thin films, on diathermancy, on vibrations in acoustics. M. Gripon prepares these sheets by dissolving 1·5 to 1·7 grains gun-cotton in a mixture of fifty grains alcohol and fifty grains ether. The collodion is poured on a glass plate, after the latter has been breathed upon so as to receive a coating of moisture. When—after some hours—the collodion is dry, the plate is put in water; and a sheet of paper having been applied and attached to the collodion by the edges, the film is drawn off with the paper.—*Scientific American.*

A NON-DRYING CEMENT of great tenacity, useful for fastening plates of glass so as to exclude air, but which may be easily separated, is formed by adding freshly slaked lime to double its weight of india-rubber, and heating to about 400° Fah., when the rubber will be converted into a glutinous mass.

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To Correspondents.

N. H. J. asks for a means of obliterating writing ink from paper so that it may again be written upon without showing any sign of the obliteration? A somewhat dangerous power to possess; and difficult in an absolute degree to secure. A solution of oxalic ink, or a dilute solution of hydrochloric acid, will remove the ink marks; but it is difficult to avoid all trace of the process.

A. MINN.—The solution is, probably, terchloride of gold. You cannot, unless you are familiar with chemical manipulations, easily make a quantitative analysis. One or two simple trials will enable you to estimate its strength nearly enough for practical purposes. Make your toning bath as usual; you will soon find out the proper proportions.

T. HIND.—It is quite possible the case was a hard one; but you do not send us sufficient details to make a clear narration. A non-suit is generally the result of some technical irregularity in bringing an action, and does not necessarily put law in opposition to justice, as it is necessary, to secure justice, that an action, no matter what the merits, should be properly and regularly conducted in accordance with the regulations provided to secure justice to all parties.

F. W. REYNOLDS.—Your proposed plan will serve well. The more elaborate system of blinding to which you refer requires a studio and skylight expressly suited to it. The curtains for the roof which you have selected will be found convenient. For the side light, curtains running on a rod at the eaves answer best. This simple construction of studio and arrangement of curtains and blinds will be easy to manage, and produce good results in general portraiture. Such an arrangement of screens as you mention will be found a valuable adjunct to your blinds, especially where unusual effects of light and shadow are required. 2. Of the two lenses that of longer focus will answer best, defining more perfectly all over in standing figures, and we think it is probable it will work in your room.

D. U. F.—There are various modes of photographing on canvas for finishing in oils. Perhaps the best method consists in transferring a collodion print to the canvas, the details of which we have already published more than once. If you wish to photograph direct on the prepared canvas, the following formula, published some time ago in one of the Continental journals, and reported upon very highly by one of our correspondents, will probably answer your purpose:—"The surface is, in the first place, rubbed by means of a pad of cotton-wool with a solution composed of liquor ammonia diluted with three times its volume of water, and this will be found to perfectly neutralise the action of the oil. Rinsing with water follows, and then the canvas is treated with a bath composed of 7 grammes of citric acid dissolved in 150 cubic centimetres of water, to neutralise any alkaline reaction upon the surface, the material being finally washed and dried. As soon as the canvas has completely dried, it is bathed with the solution hereafter mentioned, in the same manner as collodion or varnish is applied to a glass plate. If the liquid does not flow easily over the surface, then a pad impregnated with the solution may be dabbed over the surface. The solution in question is prepared by dissolving 5 grammes of pulverized citric acid in 250 cubic centimetres of alcohol, and adding 3 grammes of chloride of calcium or strontium, reduced to powder and dissolved, and subsequently 3 grammes of gum benzoin, also powdered and dissolved. The solution is allowed to stand for a few hours, is filtered, and may then be employed forthwith. As soon as the canvas has been treated with this solution and dried, it may be sensitized. The silver bath is the same as for salted paper, and it is applied by means of a brush, after the solution has received an addition of 4 grammes of ammonia per 30 cubic centimetres, and has, moreover, been rendered slightly acid by a few drops of chemically pure nitric acid. The photograph is toned and fixed in a solution composed of:—

Hyposulphite of soda	180 grammes
Water	1 litre
Chloride of gold	

After treatment in this bath the canvas is thoroughly washed with an ample supply of water for several hours, and when dry the image is quite ready for the painter."

J. W. D.—It is quite impossible to form any definite idea of the relative exposure required by the two lenses without precise statement of equivalent focus and aperture of each. You will ascertain most easily by trial. 2. The most difficult points of development-printing consist in avoiding any trace of fog or deposit, and in the preservation of clean whites, a difficulty which would be greatly increased by alkaline development. We have tried alkaline development with bromide, and also with chloride, as a restrainer. When sufficient restrainer is added, no gain in time is secured.

DR. MANTELL will find details of the process referred to in our YEAR-BOOK for 1875, p. 133. The preservative consists of water 10 ounces, tannin 50 grains, laudanum 60 grains. The mixture causes a precipitate, which is filtered out and 50 grains of powdered gum-arabic added. The preparation is then ready for use.

ANXIOUS A. B. C.—The Autotype Company—or, practically speaking, Messrs Spencer, Sawyer, and Bird—are the owners of the various patents included in the working of the Autotype process; but no charge is made for permission to work the process; the only condition is, that the materials must be purchased of the Company, a condition easy to comply with, as you could not get the materials readily elsewhere, nor easily prepare them for yourself. 2. You had better get the second-hand catalogues of Mr. Morley and Mr. Lawley, advertised in our pages, and select what you require. We cannot recommend special goods or special makers in this column. Ferrotype plates are black iron plates for producing collodion positives.

J. NELSON.—We fear your misfortune is without remedy, as the cost of repair by any English optician would be greater than the original cost of the lens.

J. WALTER.—It was a compositor's error, which will be duly corrected; many thanks.

Several correspondents in our next.

The Photographic News, January 14, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

CAN THE SPECTRUM OF THE CORONA BE PHOTOGRAPHED?

A CORRESPONDENCE of considerable interest to photographers, and especially astronomical photographers, has appeared in *Nature*, about which we feel bound to make a few remarks. The question under discussion is whether the spectrum of the sun's corona can be photographed in all its details; and two great astronomical authorities, Mr. R. A. Proctor and Dr. Schuster, seem to entertain no doubt whatever upon the subject. Our readers know very well that the corona is the luminous halo round the sun which is seen when the whole of that body is obscured by the moon—during an eclipse, for instance—and this corona has frequently been photographed, many readers, no doubt, still remembering Mr. Davis's fine pictures, which were exhibited at the Photographic Society some years ago. In some of these photographs the fiery protuberances of the sun were well shown; but it was necessary to see several images of the same phenomenon produced by exposure of different lengths in order to be able to appreciate fully the whole of the details. It was the same with Mr. Brothers' pictures of the corona, which are among the best that have yet been secured, the plates in this instance having been obtained—as Mr. Brothers himself stated—with an exposure of eight seconds only. In America Professor Morton has photographed the corona; but in this case the exposure given was two or three minutes, although the image was photographed direct in an ordinary camera, so that no waste of light might occur, a method which is most in favour with astronomical photographers. But a photograph of the corona and one of the spectrum of the corona in all its details are, naturally, two very different things, and we, for our part, say frankly that we do not see as yet how the corona's spectrum can be recorded photographically. Yet Mr. Proctor, in last week's *Nature*, referring to a letter of Dr. Schuster's, says:—"Dr. Schuster proves very readily that the spectrum of the corona can be photographed in one minute; but I am not aware that anyone has questioned the fact. What I questioned myself was, whether the spectral image of the corona can be so photographed that the true extension of the corresponding coronal envelopes can be shown." If we refer back to what Dr. Schuster did say, and turn to *Nature*, December 2, 1875, we find these words:—"I should have liked to postpone the question whether it is possible to photograph in all its details the spectrum of the corona in the time available during eclipses until Mr. Proctor's long promised mathematical solution has appeared. As, however, we have had to wait for it already a considerable time, I venture to submit to your readers the following considerations:—The prismatic camera is a spectroscope without collimator. It has given us photographs after one minute's exposure, and would have done so in less time under more favourable atmospheric conditions. If the lens of the telescope . . . . . We should thus have an instrument capable of photographing the spectrum of the corona in one minute." So that, obviously, both Dr. Schuster and Mr. Proctor, whatever may be their opinions upon other matters, are unanimous in agreeing that, beyond a doubt, the spectrum of the sun's corona can be photographed. As, however, it has never yet been done, we cannot help thinking that both gentlemen are going a little too far, especially as Dr. Schuster clearly says the spectrum "in all its details." When Dr. Vogel, on the occasion of the last Solar Eclipse Expedition, of which Dr. Schuster was the chief, proceeded to the Nicobar Islands, we discussed in these columns the possibility of his being able to secure a spectrum of the corona, and we expressed a fervent hope at the time that the learned professor's labours might be crowned with success. If anybody could produce the whole spectrum intact, he said, Dr. Vogel was that person, for his coloured films of bromide of silver were alone competent to render perfectly the red and yellow rays of the spectrum. It was all a question of time, however. Ten or twenty seconds were necessary in producing Dr. Vogel's spectrum pictures of the sun, operating in broad daylight, with the full force of the sun coming through the slit of his spectroscope. But photographing a spectrum of the corona would be a totally different matter. It is very exceptional to have a total eclipse lasting longer than two or three minutes, and this is the limit, therefore, of any exposure that can be made. If we take ten seconds as the period necessary to get a good picture of the solar spectrum (an imperfect image may be taken sometimes in one or two seconds), then to secure a similar one of the corona in three minutes, the light emitted from the latter must be not less than one-eighteenth of the solar power. Or, if we like to put down one second only, as the time for securing a solar spectrum, then the corona, to do the same work, must have $\frac{1}{180}$ the power of the sun. It has, however, no such power, as we know very well; for while an over-exposed image of the sun itself may be produced in far less than $\frac{1}{100}$ of a second, a picture of the corona requires eight seconds, or at least eight hundred times as long. We hardly think, therefore, under the circumstances, that Mr. Proctor and Dr. Schuster are warranted in making the statements which have appeared, and which might lead any one to suppose that the photographing of the spectrum of the corona is a foregone conclusion. We only hope such a thing to be possible, and that one of these days the affair may be accomplished; but if it is, we think the photographic record will not be due, as Dr. Schuster holds, by means of an instrument of improved construction, but rather by the aid of a more sensitive film, or a more active developer than we at present possess.

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ABOUT CARBON PRINTING.

BY JABEZ HUGHES.

CARBON printing is now an established fact. During the last few months it has taken a firmer hold on photographers than during the whole previous time that it has existed. This is due to the excellent tissue now made by the Autotype Company, and to the valuable lessons which M. Lambert has given, and is now giving, to photographers all over the country. When a man produces first-rate carbon prints from your own carte and cabinet negatives under your own eyes, and tells you and shows you how it can be done, then there can be no denying that the demonstration is complete. M. Lambert does this, and hence the enthusiasm he creates among his pupils. As the result of his labours, I trust before another year comes round, there will be many more than one establishment that will be able to make the satisfactory announcement that only permanent prints are sent out.

If the question be asked—and it is a very proper one—"Can as good prints be produced in carbon as in silver?" I must, with my limited experience, give a qualified answer. My reply is that the result will mainly depend upon the negative; with suitable negatives I distinctly say that as good prints can be produced in carbon as in silver. With other negatives the results may be inferior, but, to balance this, there are many negatives that yield better results when printed in carbon than in silver. This is the answer I give to the query as it now stands. But if the question be put as a test for the value of the two processes, I say that it is scarcely a fair one.

Let us remember the different conditions of the two processes. The silver is an old and a well-worked one, and is probably as perfect as it can be made to be. Endless experience has been exhausted upon it, and, while its good points have been highly perfected, its inherent defect of liability to fade remains apparently as unconquerable as ever. Even if the sulphur in the albumen and in the hyposulphite can be eliminated—almost a hopeless thing to expect—yet, so long as the world lasts, the sulphur in the air will tarnish silver. But the carbon is comparatively a new, an unworked, and an undeveloped process. Although it has existed for some years, yet there have been but few workers in it, and even these few have not used it as a substitute for silver in small delicate work. To compare the two methods is like contrasting the capacities of a growing youth with a well-developed, experienced man. Therefore, I say that with our present limited knowledge of the one and our ripe experience of the other, we are unable fairly to compare the two. And for this reason I say that I long for the same extended practical experience to be brought to bear on the carbon that has been so beneficial to the silver. When this has been done, and not before, we shall be able to judge which is the better printing process.

But if we can now, with our limited experience, produce work that will bear comparison, on the whole, with the best silver work, what may we not reasonably hope for when a fresh corps of skilled workers enrich and improve an already sufficiently-good process? My continued experience with it convinces me that, good as it now is, there is scope for further advancement as we understand it better.

Anyone who now starts with this process may rest assured that he is not employing an exhausted process, but one that is capable of greater improvements, which are certain to come, because the very elements of present success are scarcely yet discovered.

In confirmation of the foregoing, I will allude to a few material points, by the careful examination of which much benefit may be expected. Photographers will never be able to make their pigmented tissue as well as they can purchase it already prepared for them, any more than they can make their own albumenized paper; they must rely on the tissue-makers. The present makers of the tissue—the managers of the Autotype Company—are men of great practical skill and energy; they by no means rely on their monopoly for the continued sale of their tissue, but on the inherent good qualities of the article they supply. They are quite convinced that further improvements are yet to be effected in the manufacture of the tissue, and as the demand increases (and I am told that it is enormously increasing) they will acquire fresh experience how best to make it suit small portrait work—a branch to which they have but recently given their serious attention.

When the time arrives there will arise other manufacturers of tissue, and the wholesome influence of competition will then come in to further improve, and probably to cheapen, the article. It is not yet satisfactorily established whether it is better to incorporate the bichromate with the pigmented gelatine, and thus produce sensitive tissue at one operation, or to sensitize it afterwards as it is wanted. By both means good work can be done, but the results are somewhat different. Both these means are in use, but more knowledge is required as to which is the better, apart from the mere question of convenience. The sensitiveness and quality of the tissue is materially affected by the strength of the bichromate solution; the mode of drying it considerably alters not only its keeping qualities, but also the nature of the image it yields. Whether other salts can be beneficially added to the bichromate requires carefully examining. The actinometers in use serve their present purpose very fairly, but better ones may be devised, as well as a recognised, stable, sensitive paper to be used with them, so that a standard actinometer may be employed, capable of general comparison.

The "continuating" action of light on the tissue is undoubtedly a fact, but more information is yet needed on the subject. Every step through the manipulations of development, &c., is capable of being varied and improved, and the relative merits of the "rigid" or the "flexible" support will pay for more careful comparison.

Some years since Mr. Swan published an important paper on "dyeing" or toning the carbon prints so as to procure increased vigour and beauty. This paper has not yet received the proper attention it deserves. The relative values of printing by single or double transfer is a subject that will yet have to be more thoroughly examined.

A glance at these topics shows the extensive field yet to be beneficially examined when a greater number of workers unite their experience. It also shows that even in carbon printing photography is by no means "used-up," or that triumphs are not yet to be achieved exactly in that direction where improvement is most needed. It should be the duty, as it certainly is the interest, of the photographer to remove the one foul blot on the art. That terrible phrase, "fading as a photograph," ought and must be robbed of its truthful sting.

I recommend photographers to take up this new mode of printing, and if they have faith in it they will succeed. If they have failures at first they must blame themselves and not the process; starting with this spirit they must conquer, and the foremost in the field will have the most honour.

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SPECTRUM PHOTOGRAPHY.

BY CAPTAIN J. WATERHOUSE, R.E.

(Assistant Surveyor General of India).

Having recently had occasion to take up spectrum photography, I experienced several little difficulties in the arrangement and adjustment of the instruments, about which I could obtain no information in the text-books, and it has therefore struck me that a short account of some of the most simple and economical arrangements for spectroscopic photography might not be without interest to some of the readers of the News, particularly as increased attention appears to have been lately given to the subject, and there is no doubt that many discoveries of great importance to photography in all its branches may yet be made by means of the spectroscope.

It will be unnecessary to enter into a description of the construction and principles of the spectroscope, beyond stating that there are two forms of it: the ordinary—usually known as the chemical or physical spectroscope—and the direct vision, both of which consist of three principal and essential parts:—1. The *prisms*, of which one or several may be used, either singly or cemented together. 2. The *slit* by which a beam of light is admitted to the prisms, and which consists of two parallel knife edges, one of which is fixed, while the other is movable by a very fine screw, by which the slit can be readily opened or closed to any desired extent. The piece carrying the slit is usually fixed at one end of a tube, at the other end of which is a lens for the purpose of collecting the rays passing through the slit, and rendering them parallel before they fall in the face of the prism. This indispensable part of the spectroscope is called the *collimator*. 3. The *observing telescope*, consisting of a small telescope by which the image of the spectrum is viewed after it leaves the prism, and is enlarged by means of eyepieces of various powers suitable to the instrument. In the smaller forms of direct-vision spectroscopes, used for microscopic and other purposes, the observing telescope is dispensed with, and the image viewed directly by the eye from behind the prisms.

With the direct-vision spectroscope, as the name implies, the image of the spectrum is observed by pointing the instrument directly towards the luminous object. In its larger forms it consists of a central tube containing a compound prism comprising three, five, or sometimes seven prisms, made of two kinds of glass of different refractive powers so arranged that the deviation by refraction of the ray in its passage through the prisms is neutralized, whilst the dispersion is kept, and a fair spectrum is obtained, which leaves the prisms in the same line as the compound ray entered them. The tube with the slit and collimating lens is screwed on to the central tube in front of the prisms, and the telescope in like manner at the back. In the smaller direct-vision spectroscope made without an observing telescope, some of which are small enough to be carried in the waistcoat pocket, the tube carrying the prisms and collimating lens slides into the one carrying the slit. In spectrum photography much may be done by the aid of both the larger and smaller forms of direct-vision spectroscopes, the only difference being that with the larger ones increased dispersion and better definition will be obtainable, and consequently the spectrum will be of greater length, and more lines rendered distinctly visible.

The direct-vision spectroscope may be used with a camera, either with or without a lens. If used with a lens, it is convenient to have an adapter, made so that it can be attached to the front of the lens, in place of the ordinary ring or sunshade, carrying the cap, and the spectroscope screwed on in the centre of it, the observing telescope having been removed so that the prisms may be quite close to the front of the lens.

In photographing the spectra of metals, or other incandescent substances, with such an apparatus, nothing more will be necessary than to point the lens and spectroscope directly towards the lamp in which the metals, &c., are being burnt, and to focus in the ordinary way, till the distinctive lines of the spectrum are seen as sharply as possible on the ground glass. In photographing the solar spectrum, however, arrangements must be made for counteracting the effect of the earth's motion, so as to keep the rays of the sun passing through the slit constantly in the direction of the axis of the collimator tube. This may be done by mounting the camera equatorially in the same manner as an astronomical telescope, or else, which is more convenient, the rays of the sun must be thrown on to the slit of the spectroscope by means of a heliostat, or mirror moved by clockwork, and adjusted so as to throw the reflected solar rays on to the slit constantly in the same direction. For ordinary purposes, however, the solar rays may conveniently be thrown on to the slit by means of a flashing heliotrope, or even a common looking-glass with a little extra mounting to enable it to be turned on a vertical axis. In working with long focus lenses and a fine slit the mirror alone will scarcely give sufficient light, and should be supplemented by an achromatic condensing lens of about 20″ focus or longer, for which an ordinary view lens will answer admirably; this should be mounted so that it may be raised or lowered as required.

Supposing the arrangement with the mirror to be adopted, the first care is to see that the centre of the mirror is on the same level, and in prolongation of the axis of the lens; the spectroscope is then attached to the lens by the adapter, and a beam of light thrown on to the slit. The image of the spectrum should then be seen in the centre of the focussing screen, and may be brought into its proper position on the sensitive plate by moving the front of the camera, and to some extent by a motion of the sliding frame carrying the slit plate. The condensing lens may now be put into its place at the distance of its focal length from the slit of the spectroscope, so that its centre may be in the line passing through the centre of the mirror, the slit collimator and axis of the camera lens, and with its central vertical plane at right angles to this line. On passing a beam through the lens so that the image of the sun is thrown on to the slit of the spectroscope, the intensity of the spectrum will be found to be greatly increased, and the Fraunhofer lines should be distinctly visible, their definition being greatly improved by lessening the width of the slit. These lines should cross the spectrum at right angles to its length, and if they are not so the slit piece should be turned in its tube till the lines are seen in their proper position. Should dark horizontal lines or streaks be observed running along the length of the spectrum, the slit is dirty, and must be carefully cleaned with a stiffish medium-sized camel (or, better, red sable) hair water-colour brush. A piece of clean writing-paper moved along the edges of the slit is also a good method of removing the dust. The greatest care must, however, be taken not to notch or injure the knife edges forming the slit, or these dark lines will be irremediable without regrinding the knife edges, which is a delicate operation.

(*To be continued.*)

THE PROGRESSIVE RESULTS OF THE PAST SESSION.

BY J. NICOL, PH.D.*

In consequence of certain statements made, I think it right to say that it ought to be thoroughly understood that this Society is not, and ought not to be, in any way held responsible for the opinions advanced, and statements made in such papers as may be read before the members. I am aware that it is held by some that what they call "silent acquiescence" should be taken as consent; but it is well known that there are often members present who have such a disinclination to speak, that they will, rather than contradict a statement, quietly let it pass, although they may be perfectly satisfied that it is not correct. The Society, therefore, ought not to be considered responsible for anything, unless it has in some way been put to the vote or been the subject of an express declaration from the chair.

I am sorry to say that, year by year, this annual paper on "The Progressive Results of the Past Session" is becoming more and more difficult to write, as year by year the amount of real progress is becoming less and less; so that, unless things take a turn for the better, a simple report of *in statu quo* will be all that shall be left for me to do.

But, although there has during the past year been little that can be called real progress, it is gratifying to be able to say that there has been no retrogression, and that, although no really new process or method of working has been discovered, the old and well-tried systems have had much that was useless and superfluous weeded out of them, and some things that are new and useful added.

First in importance, although not in chronological order, is, I think, the great measure of success which has attended the exhibition of the London Photographic Society, as it indicates a state of matters that cannot fail to have an influence for good on the art generally. I do not refer to the financial success of the late exhibition, although that is a matter for congratulation far beyond the bounds of the Society itself, but to the triple fact that the collection, taken as a whole, showed a very decided improvement in photography from an artistic point of view; that it received at the hands of the press an unusually large amount of favourable notice, which cannot fail to exert a powerful influence on the public mind; and that there was on this occasion an entire absence of that petty jealousy and want of harmony which in some previous instances were so painful to those who had the success of photography so much at heart. The great value of photographic exhibitions, in which the best works of the best workers being brought together act as powerful levers for the advancement of photography as an art, is almost universally admitted, and therefore I hope that the success of the last exhibition in London will stimulate and encourage other societies throughout the country to go and do likewise.

Those who claim for photography a high position as an art, are equally ready to admit that the photographer depends to a large extent for his comfort and his success on the perfection of the mechanical appliances which are at his disposal; and, as the laws of supply and demand obtain in this as in almost all other things, we may take it for granted that he is fairly satisfied with the degree of perfection already attained; as, so far as I can remember, only two pieces of apparatus have been introduced, and they are both simply modifications of older tools. Curiously enough, they have both the same object in view—the changing of sensitive plates in the field. The first is Aird's camera, of which I have already spoken well at former meetings, and which, after long experience, I still very much admire; the second is the changing-box and slide introduced by Mr. George Hare, which I had the honour of exhibiting before this Society, and which, I understand, is very much liked by all who have used it.

Landscape photographers have long wished to find a substitute for glass, and many experiments have been made with a view to supply the desideratum; but I know from experience that they are slow to take a hint, and will not move till they see the matter actually carried into practice.

In the *British Journal* of June 19, 1874, the editors published a method by which a very sensitive film could be easily made on a paper support; but, although I know that excellent results could be obtained in that way, I doubt whether a dozen operators ever gave it a fair trial. Exactly a year later, Mr. L. Warnerke brought the subject before a meeting of the South London Photographic Society, and gave full details of a process almost identical; but I doubt whether, even although he shortly thereafter offered the tissue for sale, those for whose benefit it was first described have taken kindly to it. There are, I think, two causes for this apparent apathy: those who might like to prepare the tissue themselves are likely to be frightened by the idea of the six or eight coatings of rubber, &c., that he seems to recommend; and those who might prefer to buy it ready prepared may not unnaturally think the advertised prices absurdly high. Judging from a pretty intimate acquaintance with the photographic fraternity, and a fairly good knowledge of their wants and wishes, I believe, now that emulsions that will keep indefinitely are both easily made and readily found in commerce, there is money to be made by anyone who will manufacture a tissue consisting of tough paper coated first with rubber and then with gelatine, ready to be cut into suitable sizes, and coated with the sensitive emulsion when required. Such a tissue need not cost more than twice the price at present charged for albumenised paper, and I feel confident that it would meet with a ready sale.

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* Read before the Edinburgh Photographic Society.

Sensitive emulsions continue to gain in public favour, and although nothing really new has been discovered, some little light has been, during the course of the year, thrown on several doubtful points. Mr. M. Carey Lea, to whom photographers are indebted for many useful hints, has given the question a good deal of attention, and early in the year published a modification of Mr. W. B. Bolton's method, which, in his opinion, constituted it not only a "new process," but one he might have patented with advantage. The modification consisted in the addition of a trace of iodide in addition to the bromide, and in the application of an organifier to the moist pellicle. For the emulsion so made Mr. Lea claimed a very high degree of sensitiveness, and was altogether so well pleased with it that he said he did not think he was ever likely to use anything else. Whether he continues to find it all that was claimed I do not know, but, so far as I can learn, it has not taken on this side of the water; and I must confess that I could not see, so far as my own experiments went, any advantage from the use of the iodide.

From foreign sources we continue to hear a good deal of M. Vidal's polychromic pictures; but, remembering the enthusiastic way in which the copies that reached this country were spoken of, and what they were when I saw them, I cannot help regarding with some doubt the statements at present made, and feel very much disposed to ask why, if they are all that is now claimed for them, we do not get an opportunity of judging for ourselves as to their merits.

Something in the same line—or, rather, something aiming at similar results—has recently been introduced by Mr. W. B. Woodbury; and, judging from the only account that I have seen, it is likely to be a success. I hope shortly to be able to bring specimens for the examination of the members, and till then shall say no more on the subject.

Passing from processes to manipulation, I may say that the only novelty about which much has been said is the "Lambertype" in its various phases. Most of you know how hot the discussion as to the validity of the patents has been, and, I have no doubt, hold your own opinions on the subject. For myself, I hold that the patents are not worth the paper they are written on, and yet I think that the licensees get full value for their money. The fact is that, after examining the pictures and seeing the process carried on, I honestly believe that the little "dodges" and "wrinkles" communicated by M. Lambert or his agents cannot fail to enable those whom they instruct to produce most admirable work; and you must always remember that every year it is more and more becoming a fact that the man who does the best work will be the most successful.

You are aware that for a long time it has been a favourite practice for those with plenty of time at their disposal to print-in fancy backgrounds along with figure subjects. This required both care and taste, even with the most simple methods; and some time ago Mr. Tilley, of Stafford, announced to the photographic world that he had discovered a new method of doing this, and afforded no little amusement by naively requesting everybody who had an idea of their own to send to him, that he might see whether his was really new before patenting it. Well, nobody seems to have hit on his method, and in September last the specification was published, and it really turned out to be a most ingenious notion; but whether it will ever be more is quite a different matter. He photographs the sitter with a black background, places a transparency of a landscape immediately in front of the sensitive plate, and a white background behind the sitter, cuts off all the light from the sitter by curtains or otherwise, and gives a second exposure. In this way the light from the white background passes through the transparency and makes a negative on the plate, except where the image of the sitter has been already impressed, that portion being protected by the sitter, who is still in position, although there is no light reflected from him. Mr. Tilley deserves much credit for his ingenuity, but I am afraid that is all he is likely to get.

Mr. Vanderweyde, after showing how to improve or touch-up photographs, and getting well paid for it, has turned his attention to how best to light the subject so as to need as little retouching as possible; the result being that he has patented a window the panes of which are placed at various angles so as to get the largest possible good out of the smallest possible amount of light. Judging from the drawings which accompanied the description, I can only say that years ago we have seen something marvellously like it, and I believe that not many years hence Mr. Vanderweyde's window will be forgotten. The man who cannot do good work without some such fantastic dodge should turn his talents in another direction.

Although not directly photographic, probably the most important occurrence in connection with photography throughout the year was the transit of Venus, in the observing of which photography was expected to play an important part. How far it has fulfilled the expectations that were formed I do not know, and not, probably, till all the measurements and calculations have been made shall we really know how far the efforts have been successful. Enough, however, has been done to show that photography has a wider, and perhaps higher, scope than the mere production of pictures; that it is really an indispensable handmaid of science; and that it has a future before it more brilliant and more useful than its past, wonderfully brilliant and useful as that has been.

But photography has its humorous as well as its serious aspect; and it is well that it should be so. We are all better of a good laugh now and then, and I for one feel grateful to those who, either by accident or design, furnish occasionally the much needed relaxation. But I have already occupied so much of your time that I shall only give one or two examples, and hope that those of our facetious friends whom I have not time to notice will excuse me, and I shall remember them on a future occasion.

Probably the finest piece of humour that has appeared during the year was in connection with some of the much-lauded nostrums by which the exposures were to be shortened one-half. It appeared in one of the journals in the form of a letter, intimating that the writer intended in future to do his work without exposing at all, as he intended to purchase two of the secret processes, each of which reduced the time by a half, and so between them left time out of the calculation altogether.

The next, although deficient in humour, is not less amusing. Mr. W. E. Batho, in giving his experiences in connection with the albumenizing of plates, tells us of a "circumstance" that he should "scarcely have suspected," and one that, I think, nobody else will expect, even after he has called our attention to it. It is this: that when we coat a plate with albumen, notwithstanding that, with a view to keep it in its proper place, we are careful to keep the back clean, it obstinately refuses to be controlled, and insists on turning round the corner, and, bidding defiance to the law which Newton thought he had discovered, walks up the back half the journey the first time, still higher the second, and, when left alone, continues slowly to crawl up till it reaches almost to the top!

Lastly, Mr. D. Winstanley—I suppose by way of a little relaxation from his more serious work—perpetrates the wildest and, at the same time, the most successful joke of the year. He knows something of the troubles which the photographer has to bear from the accumulation of ether and alcohol in his bath, and also that they are generally cured either by boiling or precipitation; but he tells us that another, and presumably a better, method suggests *itself*. He is cautious, you will notice, and in a sense repudiates the idea of the suggestion coming from himself. Well, the fatherless bairn thus launched into the world *is* a "stunner." The alcohol is to be removed by the addition to the bath of such substances as it will dissolve—for example, vegeto-alkalies, resins, essential oils, &c., &c. The ether is to be treated in the same way with oily and fatty matter, phosphorus, certain saline compounds, and some organic principles, while a dose of gun-cotton will greedily take up the two when they are mixed together. In case this should not be quite clear to the minds of all present, it may be well to supply a somewhat liberal translation, which may be read as follows:—When you find your bath in a state in which I hope you never find yourselves—too far gone from the effects of alcohol—and especially when, as is generally the case, it is accompanied by a quantity of ether as well, treat it to a dose of cheap salt butter, the ends of a number of lucifer matches, a squeeze of the rind of a lemon, a pinch of rosin, and a few tufts of gun-cotton. Shake well for a few minutes and filter, and——well, I cannot say what is to be done next, but feel inclined to apply to the process *Punch's* celebrated lines in connection with the *papier moure*:—

"I'd rather not try it on my cat
If I could try it on another."

PHOTOGRAPHY AND FASHION.

BY GEORGE HOOPER.

The following remarks are intended, in a measure, to explain how it is that imperial, promenade, and boudoir portraits are not popular with the public; and also to make a suggestion for the consideration of the profession generally, as well as a hint to album manufacturers.

The fascinating art of photography, like almost everything else, has its fashions. Some have passed away, such as the old Daguerreotype, with its conventional pose and universal complexion tint; also the cold over-exposed glass positive, with its accompanying matt preserve and shabby case. Both these styles have been for many years superseded by the universal carte-de-visite, and other sized photographs by the same process known many years ago as 12 by 10, 10 by 8, 1-1, 1-2, 1-3, 1-4, 1-6, 1-9, and locket sizes. This multiplicity of sizes was found to be a mistake, and as the carte gained popularity the other sizes waned. Some have since been lost sight of altogether, and those that have chiefly survived the contest may be stated as 12 by 10, 10 by 8, and 5 by 4 or, the 1-3 size. This last size has, to some extent, suffered through the introduction of the cabinet portrait; but, in my humble opinion—although cabinet sized portraits have become popularized—yet they have not proved a decided success, and that for reasons which I shall now explain.

Imperial, promenade, and boudoir portraits are all, more or less, elongated cabinets, and likely to prove equally unsuccessful, and that for the following reasons. The cabinet portrait, when first introduced, was generally a full-length figure of a lady or gentleman moderately attired, but standing in some palatial hall, and reviewing the immensity of space from in front, or leaning over a massive balustrade or pedestal leading to imaginable parks with winding walks and miniature lakes. Another style was to produce a vignette head, highly worked up by the pencil until all likeness had disappeared, and then tint all the rest of the ground as if to use up the paper. A third style was to take three-quarter-length portraits, with the usual chair and curtains; and a fourth style, a large bust against a dark ground, sometimes printed plain, and sometimes in an oval with a tinted margin, sometimes lit *a la* Rembrandt, but more frequently flat and dead against the background.

All these recent sizes have been intended chiefly for full-length portraits, and the reason they are not popular is to no small extent attributable to the present extravagant, inelegant, as well as inartistic style of dress adopted by ladies, and chiefly those of tender age—in fact, just that age when photography should come in and assist by depicting them in their best attitudes, with their winning smiles, piercing eyes, and flowing manes, or more graceful curls. The want of taste in dress displayed by ladies of the present day, by the mixing up of incongruous colours, and the patchwork kind of costume generally adopted, has had a considerable influence in the noticeable decline of full-length portraiture. It is really a treat, in these days, to see a lady enter a studio with a nice full flowing skirt of silk, with a moderate amount of crinoline, instead of the tight-fitting scanty skirts now adopted, wound tightly round the waist in front, and hunched up at the back in a most inartistic fashion, and more resembling a bundle of rags than what is termed a costume. West End swells, a short time ago, wore trousers that fitted so close to the under-standings that to sit down was next to an impossibility; so now the ladies must likewise wind themselves round so that they can scarcely walk; and as to sitting comfortably, that is out of the question. Again, tight lacing, which was supposed to be a thing of the past, having been universally condemned as most prejudicial to health, is, we find, by the new corset re-introduced; and ladies are once more to barricade themselves in steel, as if they were ironclads. Are elongated waists graceful,—are dog collars that cover up a lovely neck desirable,—are the extra high heels any advantage, except to weaken spines and bring on premature consumption? Surely photographers should use all their influence to stay such retrogression as to art in dress, for the present fashions, if continued, will in a few years' time result in the photographs of the present time being held up as a proof of the follies and fooleries of this fast-going age, and be known as one in which ladies ignored the harmony of colours and neglected the grace of nature, in order to dress themselves up so as to be a spectacle to their own sex, as well as the astonishment and disgust of all sensible men.

Enough has been already said, although I could equally as well descant upon the various styles of head-dress adopted, and the so-called bonnets of the age; but I will conclude these remarks on dress by asking what we can do in our capacity as artists to stay this state of things? I reply, refuse to reproduce such extravagances, either as imperials, promenades, boudoirs, or full-length cabinets.

One word now in favour of the old (5 by 4) three-quarter length picture. This size, which is of the same proportions, comparatively, as the 10 by 8, and also, I might add, in proportion to many of the ordinary canvasses supplied to artists in oil, is, in my opinion, to be strongly recommended. I know several eminent in the profession who have always regretted the introduction of the cabinet, which, in an album, occupies a whole page; whereas albums could easily be constructed that would take four 5 by 4 pictures on a page, and then occasional leaves could be left for 10 by 8 portraits. These albums would become very popular, as the public would get more for their money—always a consideration in buying and selling. The first enterprising firm that will bring out albums for cartes, 5 by 4, and 10 by 8 pictures, will certainly never have to regret the experiment. This size (5 by 4) is also a most agreeable size for miniature work, whether in a shut-up case, or in some handsome frame as a mantelpiece ornament. The proportions are so excellent, both for gentlemen, ladies, and children, that it is always liked by colourists, and does not necessitate that exhibition of accessory that is ofttimes so vulgar and out of place in a cabinet portrait.

I hope I have not trespassed too much upon valuable space in my anxiety to advocate the re-introduction of the 5 by 4 portraits, which I know, from eighteen years' experience, to be a commercial success, and, if generally adopted, will, on its own merit, outlive all cabinets, imperials, promenades, and even boudoir portraits.

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The Photographic News.

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THE GENERAL ADVENT OF CARBON PRINTING.

THAT some form of permanent printing (probably carbon printing) must eventually become general amongst photographers can scarcely be doubted. The stigma of instability attaching to their work has probably done more to lower the status of photographers than any other cause. In the public mind, impressions, more than logical conclusions form opinion ; and when the treasured photograph—once, perchance, a thing of beauty, and endeared by tender associations—is seen to gradually fade or to become hideously blotched and jaundiced, it is little wonder that the producer of the photograph is associated with the mingled feelings of disappointment and disgust which the instability of his work has evoked. The art cynic who relegates photography to a position outside the circle of the fine arts, with superb disdain enunciates his conviction that it is only in conformity with the eternal fitness of things that photographs should fade, since nothing should live which is not worthy of life—nothing endure which is not worthy of continued existence. Hence a photograph which is a simulacrum of any object, rather than a picture of it, a body without a soul, is fitly doomed, he declares, to a merely temporary existence, rapidly passing away out of sight. And with this class of critic and his congeners the photographer is associated with his work. And so we might proceed multiplying illustrations of the fact that it is scarcely possible to claim or secure a very high status for the profession, when the work produced is becoming a synonym for instability and untrustworthiness.

"But all photographs do not fade," we hear some hundreds of readers exclaim. No, of course not ; but how many of these gentlemen would like to give a guarantee that their work—silver prints, of course, we mean—should not fade? Something like a score of years have clapsed since the Printing Committee presented their report as to the causes of fading in silver prints, and very shortly afterwards the alkaline gold toning bath was introduced, which was to effect the salvation of silver prints from the destructive agencies which the committee had pointed out; but it is doubtful whether the photographs produced at the present day, although beyond a question more beautiful, are more permanent than those produced a score of years ago. Of late we have heard many murmurings to the effect that the photographs of the last few years seem less stable than those produced a dozen years ago; and there is the still more perplexing fact that the causes of instability are full of uncertainty. A few years ago one of our most experienced and distinguished portraitists, examining a stock of his prints of a few years back, found all more or less changed, with the exception of those taken upon a certain sample of paper, and this sample of paper, he remembered, had been prepared with decomposed albumen, the stench of the paper being almost intolerable. More recently, some equally experienced and distinguished photographers have come to the conclusion that the tendency to fading of the prints of the last two or three years is due to the use of decomposed albumen, and they also base their conclusion on careful observation. Many photographers have been disposed to attribute the fading of prints to the presence of sulphur in the albumen, whilst others trace it to the use of blood albumen, in which sulphur is present in a much smaller proportion. And this difference of opinion is not unnatural, inasmuch as no certain and definite means of tracing all the causes of fading exists.

We know that a silver print, properly toned, washed, fixed in fresh strong solution of hyposulphite of soda ; again rapidly and thoroughly washed, will, in all probability, possess a tolerably long tenure of durability ; but, with the utmost care, we cannot guarantee it. Occult causes of fading at times come into operation which defy detection. And after the best has been done for the silver print, there remains the fact that it *is* silver, one of the most easily tarnished of all metals. In the face of these facts, we repeat, no one can doubt that silver printing must eventually give place to some more permanent process.

That many photographers should cling to it very affectionately we can easily understand. The quarter of a century during which it has been practised, which has done so little for stability, has done much for beauty. In delicacy and brilliancy of result it has attained a high state of perfection ; and the working details have acquired a high degree of certainty. Carbon printing, on the other hand, is, as Mr. Hughes points out in an article we print on another page, a comparatively new process. It is in the state in which silver printing was more than a score of years ago. Carbon printing has by many photographers yet to be learnt, and the experience that will at once detect and remove causes of difficulty and defect has to be acquired personally by working through difficulties. The inventors and pioneers of the process—Swan, Johnson, the present Autotype Company, and others—have for some years past been steadily discovering these difficulties, and endeavouring to remove them. Photographers who commence now, begin on comparatively beaten ground, which the frontier men have prepared for them ; but, still, some personal experience must be gained by trial, failure, renewed trial, and success, before any man becomes a skilful carbon printer.

Besides the difficulties arising out of want of familiarity with the process, there are others which have operated as barriers to the adoption of carbon printing. It is a fact which cannot be denied, that whilst pioneers in the process have been steadily working to make the process one which might be commercially practised, and to remove technical difficulties, it has not advanced with equal steps in beauty of result. Some of the early examples by Mr. Swan, produced on a collodion tissue, were quite as fine as any prints which have been since produced, and finer than the mass of everyday results produced by the carbon process. Many of the subsequent examples were dull and weak, lacking delicacy and brilliancy, especially if produced from thin negatives. Hence, a notion got abroad that a special class of brilliant negatives was required to produce tolerable effects in carbon ; and that, failing this suitable negative, the results were inevitably poor. The truth is, as may easily be seen on a moment's reflection, that no process possesses inherently such a large degree of adaptability to every kind of negative as the carbon ; but photographers have not yet mastered the conditions. A dozen years ago, when the change was first made from dense pyro negatives to delicate iron negatives, a similar difficulty was common in silver printing, until papers were prepared adapted to the new conditions ; and now some of the most brilliant silver prints are produced from thin negatives. Carbon can meet these conditions even more completely than silver; but in a process so new, so completely different in all its parts to photography with the salts of silver, there was inevitably much to be learnt before the process acquired perfection in all its parts. The quality, proportions, and treatment of gelatine had to be studied; the pigments in their double relation of permanency and adaptability to the process; the chrome salts, their proportions and relations to the pigments; all these, besides a score of points of manipulation, had to be thoroughly mastered coincidently with the maintainance of beauty. And now these points appear to be fairly mastered, and when the tissue and manipulation are suited to the negative, and under the control of a skilled printer, the highest beauty as well as the highest permanency is attainable. A glimpse at the difficulties which have engaged the attention of the pioneers may be obtained from Mr. Johnson's paper in our last, in which he points out that two of the most irritating defects —non-adhesion to the temporary support for development, and reticulation of the carbon image—have been found to be due to conditions in the gelatine which rendered it most suitable for single transfer work, and only recently discovered to be inimical to double transfer work. The cause discovered, these defects will vanish. Other difficulties have been removed in like manner, and we have no hesitation whatever in saying that when the same amount of ability, the same amount of experiment, discussion, and experience, have been brought to bear on carbon which has been devoted to silver, it will as far excel the latter in artistic beauty of results as it does in the promise of permanent existence.

Another obstacle to the progress of carbon printing is the antagonism of many photographers to a patented process. A very few words will show how great has been the gain to the community in the fact that the carbon process has been patented. To bring it to its present high state of perfection has required the steady application of years of time, much capital, and the concentrated ability of several able men. None of these things could possibly have been devoted to the process without the probability of remuneration to be gained by having the sole right to reap the results of this time, capital, and ability. If the results of this concentrated attention and many thousands of pounds which have been invested had been common property, they would never have been invested, and the process would very slowly, possibly never, have attained its present state of perfection. Although patented, never was patent used more liberally. It is used solely to restrict certain operations which do not in any way affect the ordinary photographer. It is used to protect the manufacture of the tissue, which no individual could manufacture with any advantage for himself. It is scarcely worth dwelling on this part of the subject; but we repeat, that it would be very easy to prove that the patents in the carbon process had been an unmixed good to the photographic community at large.

Our special aim in these remarks is to induce photographers to look gravely at the facts as they stand. That the time is coming when carbon printing will be general, we have not a doubt; and it is important to all photographers who wish to maintain a position in the art to be prepared for it. The signs of the general advent of pigment printing as the recognized method of producing photographs are not wanting. We recently noted the rapid progress in Belgium. More recently, Mr. Sawyer, of the Autotype Company, has been over to Belgium to teach a class of photographers the practical details of carbon printing. Mons. Lambert has recently travelled as a missionary of carbon printing, demonstrating with singularly practical skill, and teaching the process to many hundreds of photographers. For military purposes in this country, under Government auspices, carbon printing has been almost solely used for years. A note just received from Captain Waterhouse, at the Indian Surveyor-General's Office, states that they are now printing from hundreds of negatives, which they are able to do at this season even in an Indian climate. Many amateurs of distinction are devoting themselves to carbon printing, amongst whom we may mention Colonel Wortley, who stated at the last meeting of the Photographic Society that he had abandoned silver printing, and found carbon printing, with the aid of modern appliances, some of which he had invented and placed before members, a pleasant and easy operation. In one English portraitist's establishment alone, as yet, it is used to the exclusion of silver; but whilst it has been moving slowly for years, we believe the rate of its past progress is no measure of its future strides, but that it will rapidly find its way into the studios of all who wish to occupy the first positions in their art. To all our readers we strongly commend a study of the article by Mr. Hughes in our present issue, and to those on the same subject by Mr. Johnson, Mr. Sawyer, and others, in our last issue and in the Year-Book of Photography just published.

ELECTION OF OFFICERS IN THE PHOTOGRAPHIC SOCIETY.

It may be well to remind members of the Photographic Society, as it is probable no official reminder will reach them in time, that the nomination of officers for election at the annual meeting to be held in February must be made immediately. These nominations must be made in writing, and sent to the Secretary twenty-one clear days before the annual meeting. As the meeting will be held on the eighth of next month, the nominations should be despatched not later than the eighteenth instant. The president retires, and is eligible for re-election. One vice-president, Capt. Abney, retires, and is not eligible for re-election as vice-president, but he is eligible for any other office. Six members of council retire, and are not eligible for re-election. The nominations to be made are therefore for president, for one vice-president, and six members of council, and all except the president must be members of Society, who have not held the same office in the past year's council, and every member of the Society is at liberty to make nominations. The nominations sent in to the secretary will be duly collated, and the voting lists sent out in due course, when members will erase the names of all but those for whom they wish to vote, and send in their papers before the next meeting.

ENAMELLED PAPER FOR CARBON PRINTS.

We have been favoured by Capt. Waterhouse, who is successfully working the carbon process on a large scale in Calcutta, with an example in which the paper with an enamel surface, used largely for photo-collotype printing, is used for the final transfer. The result is admirable, giving the print a delicacy and richness rarely seen: with all the artistic quality of a matt surface, it possesses brilliancy and tenderness of detail of the most highly glazed surface. Captain Waterhouse says:—

"I enclose a carbon print by single transfer on the enamelled paper used for collotype printing. The results are very superior in brilliancy and general effect to those produced on the transfer paper furnished with the tissue by the Autotype Company. I do not know if the same effect has been noticed in Europe; if not, it may be an interesting thing to know. The subject is a 'life convict,' and we are now commencing to print off several hundred negatives of the same kind, all by the autotype process. It is simple, and, at this time of the year, quite easy to work. I hope to be able to use it largely in future to replace silver printing."

ELEVENTH EXHIBITION OF THE FRENCH PHOTOGRAPHIC SOCIETY.

To open the same day as the Exhibition of Painting and Sculpture, on the 1st of May, 1876, at the *Palais de l'Industrie.*

The French Photographic Society are about to organise at the *Palais de l'Industrie* its eleventh exhibition of objects in all departments of the art.

The Society invites all French and foreign photographers, and makes known the regulations which were drawn up at the general meeting held 3rd Dec., 1875. They are as follows.—

1. The opening of the exhibition will take place on the 1st May next, and close on the 31st July following.

2. Everyone, whether a member of the Society or not, desiring to exhibit, must give notice to the secretary as soon as possible before the 15th March. They must specify the amount of space required, according to the conditions indicated below.

3. All exhibits must be sent carriage paid to M. E. Koziell, acting secretary of the Society, at the *Palais de l'Industrie*, *Port No.* 1, *du* 1*er*, on the 10th April, at the latest.

4. They must be accompanied by a note indicating the number of objects forwarded, and signed by the exhibitor.

5. Exhibitors must protect their prints by means of frames or passe-partouts.

To obviate the expense and difficulties of transport in connection with foreign contributions, the committee recommend these to forward their prints in sheets to their correspondent in Paris, desiring him to place them under glass and to remit them to the *Palais de l'Industrie.* In this case the exhibitors should give notice of the despatch of the prints, to M. E. Koziell, addressing him direct at the Society's office, No. 20, Rue-Louis-le-Grand.

Those exhibitors who have no correspondent at Paris may send their photographs in sheets to the acting secretary, who will put them under glass with due care and economy. In this case the pictures should arrive at the Society's office not later than 5th April. The payment of the expense incurred should be made before the opening of the exhibition.

6. Exhibitors should write their names upon the isolated prints, or upon their frames. They may also indicate their address, but it is forbidden to place above or inside the frames inscriptions which, by reason of their size, form, or nature, partake of the character of an advertisement.

7. It is obligatory to mention the subject of each print, and state the process, whether dry or wet, waxed paper, &c.; any other details connected with the negative or positive method employed will be accepted with pleasure.

8. No mention of price will be permitted on the pictures or the frames. The prices may, however, be mentioned to the acting secretary, who will place the information at the disposal of the public.

9. No picture can be withdrawn from the exhibition before its close, even in the case of a prolongation.

10. All works sent in will be subject to examination by a hanging committee, who will decide as to their admission or rejection.

The committee do not think it necessary to mention any limit in the number of pictures exhibited by each individual, but they trust that exhibitors will aid them by exercising a conscientious choice in the first place, especially in regard to portraits and cartes-de-visite.

11. A special jury to make awards will be nominated under the following conditions:—

The exhibitors will be convened for Friday, 12th May, 1876, at the rooms of the Society, at eight o'clock, to nominate a jury of awards. Those gentlemen having a majority of votes will compose the jury.

Those exhibitors, whether French or foreign, who cannot take part in the election may send their vote sealed up, in a letter signed by them. This letter must arrive not later than the 12th May, at 9 p.m.

The jury of awards will be composed of eleven members, and the vote will be by majority. The committee reserve the right of adding two foreign members to the jury, in case the foreign exhibitors do not seem to them adaquately represented.

The members of the jury will be excluded from competing.

Awards will be made for:

a. Photographs in silver salts.

b. Photographs in carbon by the Woodbury process, and in alterable pigments of any kind

c. Photographs in greasy ink, engravings, photo-lithographs, &c.

d. Application of photography to scientific research, to astronomy, geography, micography, &c.

The Society will place at the disposal of the jury a certain number of silver and bronze medals; the jury may designate, moreover, works worthy of a medal or honorable mention.

13. The Society charges itself with all the general expenses of organisation, &c., but the exhibitors must pay a uniform and fixed price of ten francs for every metre of surface occupied by their frames. Those who desire to exhibit specimens, as transparencies, or upon the table, must pay the cost of fitting up, together with an estimated amount for the space occupied; they should communicate on this point with the secretary of this Society beforehand.

Exhibitors must forward before the 31st March half the amount calculated upon the space they intend to occupy. The remainder must be paid between the 15th and 25th of April, after the hanging committee have made their decision. If the first payment exceeds the amount due from the exhibitor, he will receive back the balance. In case of exhibitors refusing to pay, the committee reserve to themselves the right of disposing of the space allotted, or drawing upon the defaulter to the amount. In case of intending exhibitors retiring after paying deposits, the sums will be forfeited.

15. Every exhibitor must withdraw, during the week following the closing of the exhibition, all pictures belonging to him, or pay the expenses of returning them to his address.

Correspondence.

THE STATUS OF PHOTOGRAPHERS.

SIR,—Although heading this article as I do, I wish to state at the outset that the subject might not be considered of sufficient interest, or adequately embracing questions of general advantage to the promotion of the art-science of which the NEWS is an exponent, to entitle it to a place in its columns, were it not that I intend associating with it one or two little matters, in the first place, and raising an important question in the second—a question which may have occurred to many, but has not, to my knowledge, been satisfactorily set at rest.

To proceed, then, I may say that it is gratifying at this time of the year to receive the compliments and hearty good wishes of the Editor in the lines intended as preface to the nineteenth volume; and it shows us once more that the Christian feeling of "peace and goodwill to all men" is universal, even unto photography. On the other hand, it is to be regretted that, on turning over the first pages of the first number of this year of grace, 1876, one should find that the vocabulary of hard names so freely resorted to in 1875 should not have been completely exhausted. I have the misfortune of belonging, I suppose, to that class designated in "Rambling Thoughts" as "men who are comparatively in good positions," and, perhaps, I have other misfortunes to a sense of which "Little Photo" has brought me. In order, however, not to follow in the line of this "reformer of men and the things that be," I will resist the strong temptation of retaliating, and content myself with informing a "Little Photo" that if he be as modest as he would like his readers to believe him, and honest in his desire to obtain accurate knowledge of the things he writes about, every possible facility will be afforded him, and satisfactory explanations given on all points raised by him in the paragraph relating to the "status of photography." No doubt the Editor of the News sees the justice and necessity of this preamble, and admits them as its *raison d'etre*.

I now come to what I consider the important question raised by "Little Photo." I hope he will no longer complain that his suggestions have not met with attention as formerly, and although he was not aware that he would raise a question of vital importance to photographers when he penned his incorrect remarks on men who are comparatively in good positions, I hasten to comfort him by stating that in the words "Not giving honour where honour is due," he has furnished me with a text most acceptable to myself, however unworthy I may be of doing full justice to it

If photography claims to be an art, as it may fairly do under certain conditions, the materials and tools should be kept distinct from ultimate results. A painter and sculptor have both assistants; in some instances it is well known that these pupils have acquired such ability as almost to carry out the whole work of their masters after the sketch had been made and the conception fully illustrated in outline. Again, for the sculptor who has made his model of clay, and decided upon the proportions, seven-eighths of the work is achieved under the master's guidance. For all that, we know very well, on beholding the finished canvas, or the statue on its pedestal, that both painter and sculptor are the "alpha and omega" in the production of these works of their brains and hands So also with photography as an art. To conceive and to carry out the production of the negative plate of his picture is, with the photographer, to produce such a picture. And I would here remark, that to conceive it is, under many circumstances, quite sufficient as his allotted task; not so with simply carrying it out. Be all this accomplished with one or with fifty assistants, there cannot remain the shadow of a doubt as to whom ultimate honour is due.

For instance, could we admit, for one moment, that Mr. Faulkner is not the author of, and deserves all the credit for, a pretty little picture called "Innocence or Simplicity," because it has been mechanically printed by "So-and-So?" The foregoing holds good for any other class of work emanating from whatever studio, when it may be found convenient to employ the services of commercial firms in order to divide the labour, reserving to the photographer the more immediately mental labour, and dispensing with the mechanical. If there be any doubt about the matter, or uncertainty left to linger over the subject about which all, even a small photographer, should feel very jealously, photographers cannot too soon open their eyes and act according to the dictates of common sense.

If this sort of erroneous reasoning were for one moment allowed to obtain, it might just as well be expected, as it was very pertinently pointed out lately by Mr. H. P. Robinson, *a propos* of a firm of manufacturers of albumenized paper, that the manufacturer's name be written on all photographs produced by their customers. Were I to follow this up to its utmost conclusions, it would occupy too much time. I write for photographers, and for them enough has been said to point out my meaning to its fullest extent.

In order not to make this too long, I intend, in another article, to offer some suggestions which, I hope, will be received in the spirit which dictates them, and taken up by able representatives of the profession to which I have the honour to belong, as

One in a Comparatively Good Position.

A PHOTOGRAPHIC LENDING LIBRARY.

Sir,—Has a society ever been started for lending books in connection with any of the many societies for the encouragement of our art? If not, surely it is a thing that would benefit the majority of members of any society. There are, I am sure, many who cannot afford to buy the books that are continually published in connection with photography. Of course a small fee could be charged on each book lent.—I am, dear sir, yours truly,

London, January 10th. Selbahc Snesoe.

[A library was a few years ago established in connection with the South London Photographic Society, the members having the privilege of borrowing the books. We do not know of any other library of a similar kind.—Ed.]

Proceedings of Societies.

Photographic Society of Great Britain.

The usual monthly meeting of this Society was held in the Architectural Gallery, Conduit Street, on the evening of Tuesday, the 10th instant, Mr. J. Glaisher, F.R.S., in the chair. The minutes of a previous meeting having been read and confirmed,

The President stated that as the next would be the annual meeting, the election for officers would take place. Himself, as the president, retired from office, but was eligible for re-election. One vice-president, Captain Abney, retired, and was not eligible for re-election as vice-president, but he was eligible for any other office. Six members of council would retire, not eligible for re-election as members of council. All members could nominate candidates for election into the vacant offices, and the nominations must be sent to the secretary twenty-one days before the annual meeting. The time would therefore be on that day week.

The auditors were then chosen, Mr. Murray and Mr. Heaviside being elected. The scrutineers of voting papers were then chosen, Messrs. Murray, Wilkinson, Bird, Dunmore, Bool, and York, being appointed.

The Chairman announced that arrangements were in progress —in fact, practically completed—for holding all the meetings of the Society in future in the Water Colour Gallery in Pall Mall, where the recent exhibition had been held, a place which would possess many advantages.

Col. Stuart Wortley then read a paper "On Some Photographic Matters," which will appear in our next. The paper treated of several distinct matters. First, in relation to the use of nitrate of uranium in the negative bath for the wet process, which he had some time ago mentioned as giving great sensitiveness. Some experimentalists had failed in securing this result. Amongst other causes this was probably due to the use of the commercial nitrate, which, as he had pointed out before, contained many impurities. It required purifying by dissolving in ether and re-crystallizing. He exhibited a sample in a test tube, a large residuum of impurity resting at the bottom of the etherial solution. The next subject was the preparation of pyroxyline from gelatine, the formula for the preparation of which he had published in the Year-Book issued in connection with the Photographic News. He believed it would be found very valuable in emulsions, and Herr Warnerke, who had been trying it, spoke very highly of its probable utility. The next object was development generally, and especially of his strong alkaline developer. The next subject was the use of sulphate of silver in emulsions, by which a much denser film was obtained. And finally, he exhibited two useful contrivances for facilitating the operations in carbon printing. One was a means of clamping large plates of glass with the carbon tissue attached, so that the squeegee could be used with convenience; and the other a frame in which a number of plates of glass, with the carbon print mounted for development, could be placed under pressure, and when filled it could be opened from the other side, to take out those first placed in, which would by the time the frame was filled be ready to take out for development. By these and other aids, carbon printing became pleasant and easy, and he had given up silver printing on albumenized paper altogether.

Mr. Spiller asked the specific object of the sulphate of silver: was it used as the sensitive salt? He was much interested in the question, as two years ago he had, in the Year-Book of Photography, recommended the extended use of this salt.

Col. Wortley explained that it was added to the bromide emulsion. Instead of adding nitric acid he added sulphuric acid;

this liberated nitric acid and formed sulphate of silver, giving much greater density to the emulsion. A transparency he exhibited showed the absence of halation with such an emulsion.

The CHAIRMAN, in some commendatory words, asked the members to pass a vote of thanks, which was done by acclamation.

Lieut. F. T. PALMER asked whether they had seen articles in the photographic press lately on the desirability of attaching to future exhibitions of the Society a room or rooms for apparatus, and if it was the intention of the president and council so to do. The boon to photographers, both amateur and professional, by so doing, he felt would be very great indeed, especially to those from the provinces; and he saw by the list of members that more than one-half are non-residents in town, and he was within the mark in saying that at least one-half the visitors at the exhibition were the same, and, in a large number of cases, did not come to town often. Every one interested in photography must feel what great benefit might be derived from seeing a collection of all the latest novelties in apparatus, with full descriptive labels attached, without the necessity of going from one end of this city to another looking for a certain photographic something that might be turned to account in his own practice. Few men who had been engaged in their art for any length of time but had been led to purchase, from descriptive advertisements, articles which, when tested, have been found utterly worthless for their work, or no improvements on that which they already possessed. One hour spent amongst such a collection, to a thoroughly practical man, who knew what he required, would be of much greater value than reading twenty articles regarding the same. But he would suggest that the apparatus sent should have some novelty about them, and not only superiority of workmanship, for objections would, he had no doubt, be made to such an addendum to the Exhibition, as derogatory and appertaining to shop; but the object of their Society was to instruct; and what better instruction could be given than to make those interested in the art acquainted with the advantages of a recent innovation or novelty? Their Exhibitions would reap the benefit in after years by having finer work on the walls, for his own practice assured him that to do first-class work one must employ good implements, and if a really useful article be shown, not only would the fraternity reap the benefit, but the exhibitor, by the publicity it would obtain. There was also a rule which disallowed coloured pictures of all sorts to be admitted; but there was one class of of them which ought, he considered, to be not only admitted, but sought after by the Committee of Management. He alluded to photo-chromatic prints, and all those by which the colours were applied by machanical means; not only would they be well received by the fraternity, but would bring possibly before the public, and let them see for themselves what giant strides their art was making towards being a popular illustrator.

The SECRETARY read a paper by Captain Waterhouse on photographing the spectrum, and pointing out the especial advantages gained by the addition of *eosine* to the bromide of silver. This will appear in our next.

Mr. SPILLER showed some photographs which had accompanied the paper.

Herr WARNERKE, speaking of the importance of the subject, said that he thought that a more promising direction for photography in extending the range of its actinic power would be in trying new sensitive substances, rather than staining films of bromide and other known sensitive salts. He had recently suggested in the PHOTOGRAPHIC NEWS ALMANAC the use of fumarate of silver, which, so far as he had had opportunity of trying it, promised good results, especially in being sensitive to orange light.

The CHAIRMAN remarked that some of the experiments seemed to revive a hope that it might yet be possible to secure colour in photographs, and referred to a negative once obtained by Dr. Diamond, in which colour was obtained, but could not be repeated; and to a result by Mr. Claudet, which reproduced a lilac waistcoat in lilac, but, unfortunately, all the rest of the picture was lilac too. After a vote of thanks,

Mr. H. DIXON exhibited by the magic lantern an interesting series of photographs of the vessels, officers, and men who recently went out in the Arctic Expedition, and gave an interesting account of the operations in securing his negatives.

Lieut. PALMER exhibited some fine photographs taken in India under difficulties.

After votes of thanks the proceedings terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE third ordinary meeting of the session was held in the Hall, 5, St. Andrew Square, on Wednesday evening, the 5th inst., the President, Dr. THOMSON, in the chair.

The minutes of previous meetings were read and approved, and Messrs. James Macfarlane, John Oswald, E. P. Moffat, W. G. Ross, and John Walls were admitted ordinary members.

The PRESIDENT wished the members a happy new year, and said it was matter for congratulation that such a large number had turned out at a season when there were so many social attraction elsewhere. He thought it might be regarded as a favourable omen, and had no doubt the year on which they had entered would be quite as successful as that just closed. (Cheers).

Dr. JOHN NICOL then read a paper on "The Progressive Results of the Past Session" (see page 15) on the conclusion of which,

The PRESIDENT said he was quite sure that all present would agree with him in saying that they had listened with much pleasure, as they always did when Dr. Nicol brought anything before them. He thought those annual papers were very interesting, as they presented in a very small compass everything that transpired of any consequence throughout the year.

Dr. NICOL then brought up his report on Mr. Smith's safety dipper, that had been remitted to him at last meeting. He said that it would be remembered that while the mechanical arrangements of the dipper had been much admired, there were some of the members who had some doubt as to its action on the bath, in spite of the soaking in a solution of silver, as recommended by Mr. Smith, and he had been asked to put the matter to a practical test. It would also be remembered that the dipper, when shown at last meeting, was clean white wood—in fact, plane-tree. Mr. Neilson had soaked it in an old bath for some hours, and then used it for a week in his ordinary work, during which time there was no appearance of injurious action on the bath. It was then handed to him (Dr. N.), and he had prepared a new bath of twenty ounces for the preparation of lantern pictures, in which, as they all knew, it was essential that perfectly clean work should be made. In that bath the dipper had remained for three weeks, and with few exceptions, several pictures had been taken each day, the last quite as good as the first, and all quite free from the slightest indication of injury to the bath. The dipper was again handed round the table, and very much admired, several members remarking that it would also answer admirably as a developing holder.

The next business was the consideration of a question from the "box" concerning the nitrate bath and its treatment.

The PRESIDENT said that he thought simplicity was much to be desired in all photographic operations, and that he believed that baths suffered more from too careful nursing and too much treatment than from real work. In making up a new bath he used the ordinary commercial nitrate of silver, and simply dissolved it to the extent of thirty-five grains per ounce in distilled water. As a rule he found it sufficiently acid to slightly redden litmus paper after the lapse of five or ten minutes. He then coated a plate with collodion, and left it in the bath for a few hours, and it was ready for use. As a rule he never touched the bath in any way, but exposed it to sunlight as often as possible, and it rarely got out of working order. When too fully charged with iodide of silver, he added an equal bulk of water and filtered, then reduced by evaporation to one-third of the whole, and generally he found it all right again.

Mr. MITCHELL said he had some time ago a bath in the state known as "sandy," and every negative sensitized with it was covered with a gritty deposit and very small pinholes. It was laid aside for some time, but on adding to it a solution of nitrate of barium, as recommended by Mr. A. L. Henderson, it was completely cured, and had done good work ever since.

Considerable discussion followed, but nothing new was elicited, except that the addition of boracic acid, instead of either nitric or acetic acids, had been found advantageous.

Dr. JOHN NICOL then called attention to a print of the interior of Beverly Cathedral that he had got from the Hon. A. Erskine, which, he said, upset at least Edinburgh notions of dry plate work altogether. It had been taken on a gelatine dry plate with an exposure of a minute and a quarter—less than a hundredth part of what he was sure would have been required by the plates that he was in the habit of working. He knew that Edinburgh amateurs had not succeeded well with the gelatine emulsion; but he saw the Rev. J. H. Palmer in the room, and, as he knew that he had been a successful gelatine worker, he was sure the meeting would be glad to hear anything that he might say on the subject.

The Rev. Mr. PALMER introduced himself as a missionary of gelatine on account of the excellence of the results which it gave, its cheapness, rapidity, and general trustworthiness, and he hoped soon to hear that baths were altogether discarded. At first he encountered considerable difficulties, but now he hardly knew what failure was. The picture exhibited was probably taken with what is called rapid pellicle, but that he did not advise the members to try, at least at first, and assured them that they would find the slow variety rapid enough. That was the kind that he now always used, and to give an idea how quick it was, he might say that in his own church, which was very dark from stained glass, he required to expose wet collodion an hour and a-half, while on plates prepared with the slow pellicle made by Mr. Kennett he got an equally good negative with an exposure of half an hour. He might add that he had found no difference between pellicle prepared by himself, and that supplied by Mr. Kennett. He had been in communication with Mr. Willis, who had wrought the rapid gelatine very successfully, and he told him that much benefit was derived from soaking the plate for some time previous to development in a twenty-grain solution of bromide of ammonium. His own practice was to soak an eighteenpenny box of pellicle in two ounces of distilled water, and then dissolve it in a water bath. The fluid ran as easily as collodion on a small plate, and was poured on and off in the ordinary way. When the plate was large the emulsion required to be spread over it with a glass rod, and he then poured on and off a quantity to ensure an even coating. Plates so coated were laid on a perfectly level shelf for a short time to set, and then reared up to dry like an ordinary plate. In the present state of the atmosphere, the film took much too long to dry spontaneously, and got injured if so left. He had therefore got a very cheap and useful paraffin stove, which he lighted in his dark room; and if the plates were prepared at night they were found quite dry in the morning. Instead of a bottle, he had found one of Clark's night lamps, or infant's food warmer, very convenient, both for keeping the emulsion fluid, and pouring it on the plates. Regarding development, he had nothing particular to say. It was the ordinary alkaline method, and although that frequently gave sufficient intensity, it did not always do so. He got density to any extent with the chloride of copper method that had been published some time ago. After fixing and washing, the negative was immersed in a bath containing about half an ounce of chloride of copper in six ounces of water, and left till the image disappeared. It was then washed and redeveloped with pyrogallic acid and ammonia, which gave any required degree of density.

Mr. **Pringle** said that he had seen Mr. Palmer make some experiments with the gelatine plates in their establishment that day, and when exposed side by side with wet collodion, they were at least quite equal in sensitiveness.

Mr. Ross said, that since the days of the Daguerreotype, he had seen nothing so extremely delicate and beautiful as the image on the gelatine film, and he had no hesitation in saying that if a tendency to fog, which was unmistakably evident, could be overcome, he should prefer it to albumen, collodion, or anything else that had been introduced.

Mr. **Palmer** remarked that the plates that had been used that day in the presence of Messrs. Ross and Pringle had undoubtedly been injured by light; but that he had sent for a supply of Kennett's pellicle, and hoped before he left Edinburgh to show that the tendency to fog was accidental.

Mr. **Turnbull** said that he had tried the gelatine emulsion both wet and dry, and althogh under somewhat disadvantageous circumstances, he had seen enough to convince him that it was much better than any other kind of emulsion.

A distribution by lot of a number of fine pictures contributed by Mr. Matheson was then made, and the usual votes of thanks were given to Dr. Nicol, the Rev. Mr. Palmer, and Mr. Matheson, and the meeting adjourned.

French Photographic Society.

A **meeting** of the Society was held on the 3rd December last, M. **Peligot**, of the Institute, in the chair.

M. **Davanne** read the regulations respecting the prize of 500 francs to be given to the author of the best dry-plate process (will appear in our next).

The **President** read a letter from M. Liebert, offering a prize also of five hundred francs as an encouragement to those engaged in the working out of a more rapid wet process.

The **President** read the names of those members charged with the arrangement of the next Exhibition of the Society. They were: MM. Aguado, Andra, Cardaillac, Chardon, Cousin, Ferrier, Villechole, Girard, Gobert, Hulot, Martin, Ravaisson, Robert, Rousselon, et Soulier. The hanging committee included the names of MM. Balard, Peligot, Davanne, Bayard, et Fortier. (For regulations, see page 20.)

M. **Davanne** announced the death of M. E. Quetier, one of the youngest and most energetic of the members.

M. **Despaquis** exhibited some prints in greasy ink, produced by MM. Arosa et Firmin Didot.

Mr. **Hedges** presented to the Society two frames of photographs of animals which were exhibited at the Exhibition of the Champs Elysees.

The Society thanked Mr. Hedges for his present.

M. M. **Quinet** submitted a filtering dipping bath. By tilting the bath, the solution ran through a valve into a second receptacle and on placing the bath upright again, the liquid flowed back through a filter.

M. **Stebbing** submitted a decanting bottle to be used instead of a syphon. Its construction was very simple. There was a tube reaching nearly to the bottom, which passed through a perforated cork, and fixed to it was another tube bent at a right angle, the longest branch of which was as high as the bottle. To extract the liquid, the tube was bent down, by means of its elastic joint, and as soon as the exterior orifice was below the surface of the liquid, the latter could be drawn off.

M. **de Vylder**, the president of the Belgian Photographic Association, who was present, made a few remarks upon the cordial sympathy which existed between the two societies, and announced that his Association had awarded a gold medal recently to M. Rousselon for his photo-engraving process. M. Vylder complimented M. Rousselon in high terms, and handed him the medal.

M. **Rousselon** returned thanks.

M. **De Vylder** then presented a silver medal to M. Leon Vidal, and MM. Levy et Cie, and bronze medals to MM. Andonin, Fleury-Hermagis, Jonte, Quinet et Reutlinger, these distinctions having been gained at the recent exhibition at Brussels.

M. **Perrot de Chaumet** gave a précis of articles which had appeared in foreign journals.

M. **Gobert** presented a report on photography at the International Maritime Exhibition held last year at the *Palais de l'Industrie.*

M. **Fleury Hermagis** exhibited a tourist apparatus and a photometer for measuring the time of pose. M. Fleury Hermagis also read a paper on the use of essential oils for preserving sensitized silver paper in a white condition.

M. **Relandin** exhibited a camera on a new plan. It was very compact, and convertable, so that the lens could be fitted to either end.

M. **Gobert** read a communication on the employment of photography as an aid to experts in discovering forgeries, erasures, and in comparing handwriting.

The proceedings then terminated.

Talk in the Studio.

Obituary.—Our readers will learn with regret of the death of Mr. S. T. Davenport, a gentleman known to all who were in the habit of attending the meetings of the Photographic Society, as one of the most constant in attendance in his duty of assistant to the treasurer, in collecting subscriptions, having been connected with the Society in this capacity from its foundation. He was financial officer of the Society of Arts for many years. Mr. Davenport's connection with the latter society had lasted for thirty-three years, and it was in great part to his unceasing and zealous efforts that the present prosperity of the institution is due. To very many of the members he was well known, and all who take an active interest in the Society of Arts will feel his loss severely. Mr. Davenport's death was very sudden; it took place on Friday last, after an illness of only four days.

Vehicular Photographs.—The philosophic Editor of our facetious contemporary, *Funny Folks*, in answering a correspondent, gives some occult information in regard to photographic portraiture. He says to "Dozie":—"Photographs are either cabinet or carte-de-visite size. In other words, you take your choice whether you go down to posterity in a cab. or a carte." He was probably not familiar with the new American size, the "promenade" portrait, or he would have given "Dozie" the further alternative of walking.

An Artist's First Attempts at Photography.—The

"London Lounger" of the *South London Press* narrates a humorous anecdote, which Mr. John Proctor gave in a speech at the recent annual dinner. He says: "The early efforts of amateurs in the art of photography are always mixed up with much that is ludicrous, and many funny incidents could be related of the dilemmas some of these enthusiasts have found themselves in when struggling with 'first principles.' At the recent dinner of the South London Photographic Society, Mr. John Proctor, the well-known cartoonist, related, in his inimitable manner, a droll experience of his own in this way. In his youthful days he had an intense desire to know something about practical photography, and after keeping his eye for a long while on a camera exposed for sale in a pawnbroker's window in Whitechapel, he finally summoned up sufficient courage to enter the shop. He inquired the price, and the instrument was brought out for inspection. Of course he was not going to admit that he knew nothing about cameras, and after a lengthened examination, with an air of profound wisdom he declared there was 'something wrong with the machine,' for the picture formed by the lens on the ground glass was upside down! In vain the shopkeeper protested that this was the proper way in which things were represented by a lens; the aspiring photographer was not to be taken in, and he left the shop fully impressed with the idea that he had escaped being swindled."

Broken Negatives.—A "Brighton Photographer" sends us the following hint on the repair of broken negatives, which may prove useful to many. "It often occurs (I speak by experience) that in printing from a valuable negative, we are liable to be surprised by our printer blandly informing us, 'Please, sir, the negative is broken—only flown in the frame.' To those who are thus afflicted, permit me to offer this hint. I take my 'broken negative,' and slightly anoint the broken edges with a strong solution of 'coaguline' (*i.e.*, gelatine and acetic acid); when dry, I rub gently a little lampblack in powder into any cracks and crevices, and I find that this mended negative can now be printed without any fear of coming to pieces again, provided that the glass is quite flat during the joining business In proof of the efficiency of my hint, I have lately printed some dozens of whole-plates from a negative thus treated with perfect success, and if the join is carefully made and filled in, the retouching required is a mere trifle."

To Correspondents.

J. C. H.—It is somewhat difficult to say which is the best book on chemistry, because we do not know exactly what you know, and how much you wish to know. For an absolute beginner, *Chemistry*, by Professor Roscoe, in the series of *Science Primers*, published by Macmillan, is very excellent. The work on Chemistry in "Chambers' Educational Course" is also very good. For a compendious work of reference, very complete, and not too large, "Fowne's Manual of Chemistry" is one of the best books you can have.

Frozen.—We fear that there is no readily available method of preventing solutions from freezing if they are kept in a situation which exposes them to the influence of frost. Some straw and a piece of matting surrounding the tub or vessel will answer best.

George Coleman.—It is difficult to indicate the precise cause of the black spots on your sensitive paper. They might arise from iron spots in the paper, but they have rather the appearance of spots caused by particles of some reducing agent, such as sulphate of iron coming into contact with the back of the paper. 2. Your carbon print is not bad for an early attempt. If the negative had had a little more contrast the print would have been more brilliant; or it would, for a small print, have been with a collodion surface. When mounted and rolled it would look better. 3. It is impossible for us to advise anyone on the prudence of taking lessons and licence from M. Lambert. We can simply tell you what we know, and leave it to your own judgment as to how far it will suit your purpose. He is a most expert manipulator, and an admirable teacher, and no one with whom we have had any communication has regretted obtaining the lessons. You must bear in mind that in operations so essentially new to the ordinary photographer as those involved in carbon printing, a few hours' tuition and actual watching of operations often saves many months of heart-breaking trial and failure.

E. G. F.—Let the studio stand east and west, so as to present the side to the north. In this case you can work at either end, depending on which side you wish to take the sitter. The length 30 feet will do capitally; but the width need not be more than 12 feet.

Anxious A. B. C.—Several of the back numbers you require—probably all—are in print. Send list to the publishers. 2. The terms whole-plates, &c., were first applied in the days of photography when the metal plates were made all as bearing relative proportion to the largest size at the time taken. This was the whole plate, which measured $8\frac{1}{2}$ by $6\frac{1}{2}$ inches; the half-plate measured $6\frac{1}{2}$ by $4\frac{3}{4}$; the quarter-plate measured $4\frac{1}{4}$ by $3\frac{1}{4}$, and so on with various sizes now little used. The cabinet size is $5\frac{1}{2}$ or $5\frac{3}{4}$ by 4 inches, mounted with a narrow margin. The card size is $3\frac{3}{4}$ by $2\frac{1}{2}$ inches, mounted with a narrow margin.

R. & J. W. B.—The mode of procedure is simple. You must instruct a solicitor, who will obtain a summons against the alleged pirate to appear before a magistrate, in accordance with the provisions of the Fine Arts Copyright Act, 1862. Your proofs of ownership of copyright on your part, and of infringement by the person charged, being clear, your remedy is simple. The sale of the pirated copies will be stopped, and he is liable to a fine of ten pounds for every copy you can prove to have been sold. It is possible, also, that you may be able to demand an account of sales, and secure compensation; but on these points your solicitor will instruct you.

Un Photographie.—Your proposed proportions will serve. For the length, twenty-eight feet will do well; a trifle wider than ten and a half feet might have been better; but this breadth will serve, and so with the height. 2. We should not exclude all light from the south side; as it may be covered in sunny weather; but may often be found useful in dull weather. 3. About fifteen feet of glass north side and roof, and coming within eighteen inches, or so, of the floor. 4. Belgium sheet glass is cheapest, and answers well, in as large squares as may be compatible with building convenience. If any portion requires obscuring, that may be done with tissue paper, starch, or other means which are easily removable or renewable. The permanent use of ground glass, ribbed glass, or anything obstructing light, is not desirable. 5. Top light alone is very undesirable; we should prefer a high side light alone to top light alone. Placing the ridge out of the centre has advantages; but in such case the top light should be brought much lower at the eaves, not only to give it a better pitch, but so as to secure a broad expanse of top light and side light in one continuous slope of glass. But with your limited breadth you cannot well afford to do this. Hence the simple ridge roof will suit your proportions best: about half as much glass in the south side and roof as in the north will serve.

Zeta asks us for information, which we should be delighted to be able to give him. He asks:—"What chemicals, on being exposed to the light, would turn to the following colours: red, blue, pink, green, yellow, and purple? and how to fix them so as not to fade? and could any one chemical be employed that, on being exposed to the light under different coloured glass, would yield any or all of the colours mentioned?" The knowledge which Zeta seeks would enable him to solve the problem which many of the ablest chemists and photographers have in vain pondered over—the production of photographs in natural colours. At present, there is little hope of the problem being solved. The nearest approach which Zeta can attain to his desires is to obtain tissue for pigment printing containing the tints he desires; he can then readily obtain a print in a monochrome of any colour he chooses; and if he adopt M. Vidal's method in various colours.

A. S. D.—The tearing of the surface in the delicate whites is due to the plate having been insufficiently waxed, or not quite clean. In delicate prints having much very delicate half-tint, it is much safer to develop on collodion. See an article by Mr. H. Baden Pritchard in our Year-Book just issued. The spots, which it appears, from your query, are not in the negative, are puzzling. Was the print kept immersed perfectly in warm water, during all the time of development, were these portions suffered to be uncovered or get dry? We have not met with a similar result.

Penshurst.—The wax paper process has gone out of use almost entirely, although it gave some very good results when in vogue. It has been superseded by simpler and rapider processes. The formula and details would occupy much, far too much, space to be given in this column. In our earlier volumes you will find many articles on the subject. Our fifth volume contains details of the process in several articles.

Vandermont.—There is no general rule, almost every case being subject to an agreement based on the especial circumstances of the case. In many instances youths and young women enter an establishment, at a moderate rate of remuneration, to do some easy and simple work, and gradually improve themselves, so as to qualify for more responsible duties and higher wages. Occasionally an apprentice is taken for a term of (say) three years, with especial agreement that he is to be taught every branch of the art. For this a premium is generally paid, and the first year's services given without payment. But every case depends on circumstances and special agreement. Your letter arrived too late for answer in last week's News.

Archer Clarke.—Thanks for your letter. We are glad to hear you are better, and shall have pleasure in hearing from you again.

W. Feldinche.—Thanks.

Several Correspondents in out next.

The Photographic News, January 21, 1876

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Tyndall on Air and Light—A New India-rubber Cement—A Good Lacquer.

Tyndall on Air and Light.—Dr. Tyndall gave further details of his investigations with air and light at the last meeting of the Royal Society, and his recent discoveries prove quite as interesting as those he made known at the Royal Institution four or five years ago. He then demonstrated pretty conclusively that perfectly pure air, with no mechanical admixture of dust or foreign particles, was incapable of transmitting illumination, and a beam of light failed to be carried any further, so far as its luminosity went, when it came to a section of the atmosphere containing no floating particles. Most people have seen the effect of a beam of sunlight entering through a crack or chink in a darkened room, and have seen floating particles of matter revolving rapidly in the column of light. It is just these particles, Dr. Tyndall tells us, which make the beam luminous, and if they did not exist we should see no illumination. The able physicist demonstrated this in a very clever manner. He had a long glass cylinder, placed in a horizontal position upon the lecture-table, filled with pure air, and, having darkened the apartment, he permitted a beam of electric light to shine through from one end to the other. The result was a faint blue haze, but no white light at all, and the Doctor asserted his belief that the blue sky we see above us is simply the effect of the light of the sun upon pure air. On admitting gradually the air from the lecture-room into the cylinder, the latter by degrees became luminous as floating particles of dust entered from outside. These particles reflect and scatter the light, and when they are not present the beam does not travel, or, at any rate, not in a luminous form. Air may be purified either by heat or by means of agents, such as acids, or, as Dr. Tyndall has proved, by simple filtration through cotton-wool. A further method of purifying air he now brings forward, which is simply to allow it to become clear by standing quiet, in the same way as we often clarify a liquid before it is decanted. Dr. Tyndall has found that by merely leaving air undisturbed in a closed chamber, it can be made optically pure, for air in this condition will not transmit light. The particles have in this case altogether subsided, and it is as mechanically pure as when subjected to purification with heat or acid. Dr. Tyndall's present researches are undertaken especially with reference to the question of spontaneous generation, but they naturally interest the photographer, who has so much to do with the action of light. Indeed, we should be glad to hear of some scientific photographer who had brought to bear photographic experience upon some of Dr. Tyndall's researches, the action of the blue haze, for instance, to which we have referred, upon a photographic plate, being a point upon which it is desirable to possess information. If it is found that the action of light upon a photographic plate increases or diminishes according to the amount of floating matter in the stratum of atmosphere between the object and the lens, then we have established a fact that may be of some considerable importance to photographers. As we have said, however, Dr. Tyndall's experiments have more to do with the matter of spontaneous generation, and this, he declares, with other physicists, does not exist. His results point conclusively to the fact that living organisms, when developed in liquids, or matter of any kind that has been in contact with the air, are due to spores floating in the atmosphere, and which have become deposited. Air which has been purified by acid or heat does not bring about any change, and, in like manner, air freed from its mechanical impurity, by standing in a closed chamber three or four days, neither permits of change nor does it transmit light. Solutions, we are told, may be left in such a chamber for months without undergoing any modification, although the same liquids exposed to the influence of air under ordinary circumstances for but a couple of days would swarm with living organisms. That air can be absolutely purified by standing undisturbed is the teaching of Dr. Tyndall's last results.

A new India-rubber Cement.—A good cement, that will render India-rubber in any form adherent to glass or metal, is ofttimes a desideratum with photographers, and in the *Polytechnisches Journal* for last month there is a simple recipe given for the preparation of such a compound. Some shellac is pulverised, and then softened in ten times its weight of strong ammonia, whereby a transparent mass is obtained, which becomes fluid after keeping some little time, without the use of hot water. In three or four weeks the mixture is perfectly liquid, and, when applied, it will be found to soften the rubber. We are told that the rubber hardens as soon as the ammonia has evaporated again, and thus becomes impervious both to gases and to liquids. For cementing the rubber-sheet, or the material in any shape, to metal, glass, and other such surfaces, the cement is strongly recommended.

A Good Lacquer.—A preserving lacquer for brass or bronze, which gives a beautiful gilding to the articles, is also mentioned in the same paper. It is prepared simply by dissolving in 332 parts of rectified spirit, 16 parts of shellac, 4 parts of dragon's blood, and 1 part of turmeric root. The metal to be lacquered is warmed, and the varnish applied by means of a sponge. Brass-work becomes beautifully gilded by this application. As the liquid is a spirit solution, it is necessary, of course, to keep it in a well-stoppered bottle.

PURIFYING THE PRINTING BATH.—A GOOD NEGATIVE VARNISH.

BY STEPHEN BONE.[*]

I have two brief hints which may interest the readers of the Year-Book. I do not claim either of them as precisely new; but as I have verified them carefully, I offer them as certainly useful and trustworthy.

Many methods of purifying the printing bath of accumulated albumen and discolouration have been tried, but many printers stick to kaolin because they are most familiar with it. Permanganate has often been suggested, but generally without exact details, and many photographers hesitate, therefore, to try it. I find that a five-grain solution of permanganate of potash in distilled water, added a few drops at a time, to the printing bath is better than kaolin for throwing down organic matter, which can then be filtered out.

I have also found that one of the best, as well as most inexpensive negative varnish, is that made by diluting white hard spirit varnish with an equal quantity of methylated spirits. It is, of course, used the same as the ordinary varnish applied with heat.

ON SOME PHOTOGRAPHIC MATTERS.

Nitrate of Uranium in the Bath—Gelatine Pyroxyline—Sulphate of Silver in Emulsions—Development of Dry Plates—Carbon Printing.

BY COL. STUART WORTLEY.[†]

The first subject to which I wish to draw your attention this evening is that of the use of nitrate of uranium in the silver bath. It will be remembered that in reading a paper to this Society in June of last year, I mentioned incidentally that an increase of rapidity was obtained by the use of that salt; some experimentalists in their practice, however, have found this not to be the case; but the fault would appear to rest in some way with themselves, as I find that in one of the almanacs just published Mr. J. Barker states, "The addition of nitrate of uranium to the silver bath, as recommended by Colonel Stuart Wortley, was also tried, and with plain bromized collodion gave splendid results; also with ordinary bromo-iodized collodion it gave a considerable increase of sensitiveness, the only drawback being that it gave a pale blue film and a weak image, which required a considerable amount of intensifying." I always use a collodion very strongly bromized, more so, I imagine, than most workers; and as that brings the conditions of my wet work nearer to those of dry work, it may account for the difference of results; I do not find any want of intensity in the resulting negative. But I also purify the nitrate of uranium and recrystallize it in the following manner:—The ordinary commercial nitrate is dissolved in ether, and I pour off the clear solution that remains at the top and recrystallize the salt therefrom. In these two bottles which I have brought with me is a nitrate of uranium dissolved in ether, and you will see copious deposit at the bottom of the bottle; this deposit is partly the water of crystallization, and partly matter insoluble in the ether; and the addition of the nitrate of uranium to the bath without the elimination of what you here see deposited is certain to produce a variety of evils. Herr Wöthly pointed out the necessity for this recrystallization of the nitrate of uranium; and I also, when recommending the introduction of that salt to an emulsion, called attention to the necessity of this purification of the commercial salt, and pointed out the way in which it was to be done. I find, nevertheless, that Mr. Werge, who wrote stating that he had found a disadvantage in the use of uranium, added the ordinary commercial nitrate of uranium direct to his bath, omitting the necessary purification. I do not, then, wonder at his failure, and would point out that if Herr Wothly found the purification of the nitrate of uranium necessary in a printing process, it is clearly necessary in the much more delicate process of taking the negative. To purify the commercial nitrate, it is only necessary to dissolve it in twice its weight of ether, and, after the insoluble part has completely settled from the solution, pour off the pure supernatant liquid and crystallize the pure salt therefrom. Those who take up this process, and bestow ordinary care upon it, will find that they gain, first, considerable increase of sensitiveness and almost entire immunity from pin-holes or stains of any kind, a retention by the bath of its original good qualities until it becomes too weak for use, the power of retaining the plate in an evenly moist condition when out of the bath for an hour or an hour and a half; and, finally, a singular power of photographing white objects without any tendency to halo or flare. In illustration of this latter point I pass round a transparency printed from one of my negatives, in which you will notice that the sun and the clouds immediately round it are as perfectly and evenly delineated as any other part of the negative.

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[*] This communication was intended for our Year-Book, but arrived too late.

[†] Read before the Photographic Society of Great Britain.

The next point I wish to bring before you is the manufacture of paroxyline from gelatine. I have published my formula in the Photographic News Year-Book, but I had some time previously given it to other workers. Mr. Warnerke has taken it up with great energy, and writes to me that he is thoroughly convinced of its very great value. You are aware that Mr. Johnston, in 1873, published his process of spreading out a gelatine emulsion on a flat surface to get dry, and afterwards cutting it up and washing it, and that Mr. W. B. Bolton has worked out this idea to a successful issue in connection with collodion. Gelatine pyroxyline is of particular value in this process where a tendency to thinness of negative is observed; and those who are experimenting in that direction will do well to adopt it. Among others, Mr. J. B. Gough wrote me some months since, that he had profited by my idea; but I find that he has published a formula recommending isinglass. I have made various experiments during the last two years with every sample of isinglass and gelatine that I have been able to obtain; and in nearly every case the former has given an unusually tender pyroxyline, so much so that it has frequently been impossible to give the negative the necessary amount of washing; and it has, besides, other disadvantages. For workers in this direction, therefore, I wish to point out that Nelson's opaque gelatine is the material to use, that the cotton, before placing in the acids, is to be soaked in a twenty-grain solution thereof, and then very thoroughly dried, and that the maximum temperature possible, short of solution of the cotton, is to be used for the acids. Mr. Warnerke has written me such copious details of his work in this direction that I hope he may be prevailed upon to give his experience with gelatine pyroxyline at the Society's next meeting, as this pyroxyline, in my practice, is most valuable in bath dry-plate work, and is not without its value in the wet process.

I now wish to draw attention to a point in emulsion work which is quite new, and which I have adopted in my work: I refer to the use of sulphate of silver. This salt, while adding to the sensitiveness of an emulsion, enables us to obtain any amount of density in very rapid emulsion plates made with a large excess of nitrate of silver. You are probably aware that, in March, 1869, Mr. W. H. Wilson was the first to draw attention to the desirability of an excess of nitrate of silver in collodio-bromide. He was very definite on this point, calling attention to the way in which it increased the sensitiveness of the film. Some considerable time afterwards, Mr. M. Carey Lea adopted Mr. Wilson's method of working, and increased considerably the amount of nitrate of silver; but at the end of the year 1870 he entirely gave up this method of working, and declared that nine grains in summer and ten in winter were the correct amounts of silver per ounce to be used in emulsion work. On the 6th January and the 10th February, 1871, leading articles appeared by the editors of the *British Journal* conclusively showing that in using nine and ten grains of silver Mr. Carey Lea was not using any excess at all; and as Mr. Carey Lea was impressing on workers in this direction that it was not only useless but injurious to use more silver than that in an emulsion, I thought it would be an advantage to my photographic brethren if I came forward and combated this mistaken idea of Mr. Carey Lea's; and in June, 1871, I read a paper before this society, pointing out the necessity of saturating the collodion with nitrate of silver, and giving detailed formulæ of my method of working. At that time emulsion photography had been much facilitated by Mr. Carey Lea's proposal to acidify the emulsion, without which important modification no really rapid emulsion work can be carried on, the only disadvantage being that nitric acid, which is far the best for the purpose, tends, with many samples of pyroxyline, to the production of a weak and thin image. Some workers use hydrochloric acid; but the chloride thereby formed in the emulsion renders the negative less sensitive and more liable to fog, while by the use of sulphuric acid in the emulsion, and the consequent formation of sulphate of silver therein, a very rapid, dense negative is, with the greatest ease, secured. From three to five minims of sulphuric acid should be added per ounce of collodion, varying according to the amount of bromide employed. It is quite easy to emulsify, and we gain the following advantages: increased sensitiveness and great opacity of film, thus doing away in a very great measure with backing or even staining the film. To show you how quickly and densely sulphate of silver is formed, I have brought a bottle containing collodion to which three minims of sulphuric acid per ounce has been added; and on addition to it of a few minims of a saturated solution of nitrate of silver, you will notice how densely sulphate of silver forms. I strongly recommend this addition to the emulsion in preference to nitric, hydrochloric, or any other acid; and I am certain that all who once use it will never again use anything else.

One word now on the development of dry plates, whether made from an emulsion or a silver bath. I find, as well from my correspondence as from the journals, that my system of using a very strong alkaline developer is gaining ground rapidly, and I will, with your permission, say a few words on this subject, as the time for experimental work is now coming on, and it is one of great importance. I have, in a paper read before this society a year and a-half ago, and in my various writings, constantly pointed out that extreme sensitiveness was secured by the use of a saturated solution of carbonate of ammonia. I have further done my best to impress upon those using strong development that the quality of the negative depended solely on the amount of pyrogallic acid used with the saturated solution of ammonia Thus we arrive at the following two propositions:—1. Great sensitiveness is secured by developing with a saturated solution of carbonate of ammonia. 2. Any character of negative desired can be obtained by varying the proportion of pyrogallic acid used with the carbonate of ammonia; thus while one minim of a forty-eight grain solution per half ounce of carbonate of ammonia solution will give an exceedingly delicate transparency, twenty minims of the same solution, with the same amount of ammonia, will give a very rich, dense negative. The following will be found to be a remarkably convenient formula for workers with any kind of dry plates, bath or emulsion:—Eighty grains of carbonate of ammonia dissolved by pounding in a mortar in one ounce of warm distilled water; one hundred and twenty grains of bromide of potassium dissolved in one ounce of distilled water; forty-eight grains of pyrogallic acid in one ounce of alcohol. In all average dry plate work one minim of the bromide solution to each drachm of the ammonia solution, and as many minims of the pyrogallic acid solution as shall give a negative of the class required, is a most excellent formula.

Emulsion workers will find it a most interesting experiment to expose half a dozen dry plates of any make, and, while keeping the ammonia and bromide at the standard strength indicated, vary the development of each plate by commencing with one minim of the pyrogallic acid solution, and doubling that amount on each successive plate. To show you the delicacy that can be obtained by this method of development, I send round two prints of somewhat difficult subjects. I am afraid I have kept the members a somewhat long time; but I can only plead my desire to help others with what information I have myself worked out, and I will ask you only for a few minutes more while I show you some pieces of apparatus I have designed for the facilitation of carbon printing. I may mention that since M. Lambert's excellent method of working has been introduced to us, I have entirely given up ordinary albumenized paper printing; and, from the courteous manner in which the Autotype Company will take any amount of trouble to produce special colours of tissues to suit individual desires, I hope never to revert to albumenized paper printing. The pieces of apparatus are as follows:—

1. What I may call a squeegee frame. I found some difficulty in holding a large glass with tissue on it, and squeegeeing it comfortably; but by fixing it in here, as you see, it is done with the greatest ease and certainty.

2. A double pressure-frame, in which all the glasses with tissue on them can be placed one after the other, with a sheet of blotting-paper between each; and as its two sides are made precisely alike, we reverse it, and when the first tissue that went in is ready to come out, the frame is opened below, and that tissue taken out. You will notice that these two blocks supply the pressure to the springs, being first used upright, then on their sides, and then taken away altogether. In this manner the whole of a photographer's day's work will pass through this frame with convenience and ease to himself. I use also two other useful dodges: one a board on which the dish of bichromate solution for sensitizing is placed, and which has at one end two glass rods, over which (one for the front and one for the back) the wet tissue is drawn to get rid of the superfluous solution; and the other a double rocking arrangement, by which the vertical bath, in which I develop several glasses at once, is put into very gentle motion during development, and which aids the gelatine to leave the plate. With the assistance of these various dodges I find carbon printing easy and certain.

I may state that before bringing these two pieces of apparatus here to-night I had shown them both to Mr. J. R. Sawyer and to M. Lambert, and as they both seemed to think they would be of use to carbon printers, I thought they might be of sufficient interest to bring before the society.

ON PHOTOGRAPHS TAKEN IN CONNECTION WITH THE ARCTIC EXPEDITION, 1875.

BY H. DIXON.*

Having had the opportunity of taking a series of photographs in relation to the present Arctic Expedition (which photographs attracted some attention at our recent exhibition), I propose saying something about them this evening which I hope may be interesting, and will show them on the screen as the easiest way of referring to them as I go on. The portrait now shown is Captain Nares, who was called home from the *Challenger* to take this command.

In obtaining these photographs I had to encounter many difficulties; and if I point out some of them, it is that beginners in that sort of work may see that they are likely to require a large stock of patience and perseverance.

First, having armed myself with introductions, we (that is, myself and son) started with a considerable amount of luggage; for, not knowing what our opportunities might be, we packed everything required for wet process for all sizes, from carte-de-visite to 16 by 12.

I may mention that for such work I use the bath about forty, rather acid, Mawson's collodion, and ordinary iron developer thirty grains to the ounce.

Once in Portsmouth Dockyard, we obtained the use of a cellar in which there was a sink and water laid on; and this made a capital dark room.

Now, having the permission of the Admiral Superintendent (Sir Leopold McClintock) to photograph, and all things prepared, we looked for our work.

Already other photographers were there, also looking for what to do. We were too soon, and were all equally perplexed. There were the ships, to be sure; but they were refitting, loading, painting, all at the same time; hardly a square yard of surface, inside or out, but some busy artificer was at work on it. Everybody was too busy to talk or to listen to me; and so nearly two days passed by before we could see our way to getting any pictures at all.

There were objects intended to play a practical part in the expedition, and of which I wanted to get a record; but they were in a rather dark room, and the articles I most wished to photograph were in front of the largest window, so that the lens would only be able to look at the shady side of them. Then, again, it was a public exhibition, and the "many-headed" walked round and round the room in a continuous stream all day long.

The only method was to make friends with the men in charge, two very old salts, one very short, the other very tall and thin; the latter of whom had been to the Arctic regions with McClintock three times, and would have gone with the present expedition but that he was too old. He was full of enthusiasm for his old commander, for his care of the men, and for his inventions, and also full of hope for the present explorers and their success.

A little persuasion induced these men to shift the objects I wanted early in the morning on to a bench by the side of an open door; and we took the negative before the public arrived.

It was a dull drizzling morning; so a very long exposure was required. We had scarcely left the spot when another photographer's camera was planted where ours had been; but I fear the owner was too late; for the public were in the room long before he could have had time enough.

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* Read before the Photographic Society of Great Britain.

In this plate is the harpoon gun (with which they now shoot whales instead of throwing the harpoon by hand as formerly), ladders, picks, anchors, and the cooking utensils for sledge-travelling, the fuel for which is spirit. In this photograph is a figure which was intended to show how the sailors would be dressed when out in the cold.

Towards the end of the public exhibition this figure was made useful by having a money-box attached to it, soliciting subscriptions to the Sailors' Orphanage Fund; and I may mention that in three days the collection amounted to £40.

Close by this room were the *ice-saws*, troublesome customers, in a very good place for the public to see, but with a bad background of boards and timber, which would have destroyed their form in a photograph.

It took great deal of persuading and several persuaders to get them moved; for they were heavy and awkward to handle. The largest saw-blade is eighteen feet long, and, being lifted up by the pulley for each cut, cuts the ice by its own weight in descending. There also is a sledge, invented by Admiral Sir Leopold M'Clintock, which weighs only seventy pounds, and is also a bridge, capable of supporting as many men as can conveniently pass along it over any chasm they may meet with that is not more than twelve feet across, and also two pair of snow-shoes bound together to form a small sledge.

H.M.S. *Discovery* was in so unfinished a state that it was scarcely worth trying a plate on it; and it was so placed in dock that I could find no vantage-ground from which to use one; but the *Alert* was more forward, a great difference having been made even in three days; and by the kindness of the captain of one of the large troop-ships, the *Euphrates* or the *Serapis* (I forget which), we got a berth on the forecastle of that vessel; and there, with the use of a triplet, obtained a picture just of the right size.

But we wanted the officers and crews, and that seemed to o be impossible. At length I got to speak with Commander Markham, and induced him to give me an opportunity of taking the crew of the "Alert" in their working dress, as when loading the vessel. Accordingly at one o'clock the camera and plate were ready, pointed at the side of the ship, and in focus for the spot marked out for the group. The men just then returned from their dinner, and were separating to their work, when Commander Markham hailed, and they all came up together. "Now," he said to me, "I can only give you a minute; only one shot, you know." So I posed them, my son took off the cap for five seconds, and then off they went, not having been hindered from their work more than two minutes.

This pleased the commander. He assured me, however, that it was hopeless to think of photographing the officers for some time to come, as they were too busy, and never together; and, indeed, each one was only to be seen on duty, or going from place to place at a speed which showed they could think of nothing but their preparations.

The men serving were selected for their fitness out of a very large number of volunteers; they have double pay, and their time is to count as double time in the service.

Next came the tents and bedding to be used by the sleighing party, which is intended to go on beyond the ships, and, if possible, to the North Pole. These were placed in a large open shed with a very good light; but there was a foggy drizzling rain, and the photograph shown is the best of three or four. The standing figure is that of the man who has been to the arctic regions three times; and the one in the duffel bag is one of the present exploring crew. He also has been there before. The old salt told me that the tents represented are made to hold eight and ten men respectively. The men get into the duffel bags without removing any of their day clothes, except their boots, which they exchange for warm slippers. They pack in as close together as they can, head to foot, only fourteen inches being allowed for each on the mackintosh which is spread on the snow; and the last man closes the double entrance to the tent, so that only the small air-tubes near the top are left for ventilation.

The last man in is also the cook for the following morning, and he has to come outside before he can strike a light: the air inside is said to be too foul for a light to burn in, while in the extreme cold it will support human life. With these negatives it seemed we should have to be content, and we returned to London to turn them to what profitable account we might; but that seemed small, for everybody wanted portraits of the officers: "If you had got the officers, you know, then," &c., &c. So we resolved to go again and get the officers.

So, as the time for their departure drew nigh, we prepared, and on May 27th were safely in the same dark room as before, and on the following morning began to work. The ships had been moved, and we secured the *Alert* at the jetty about eight o'clock, and the *Discovery* soon after; but while taking a second plate of that vessel, thunder came, and then a downfall of rain that continued more or less heavily all day. No officers yet! and the expedition was to start at two o'clock on the morrow. With much trouble I succeeded in making appointments with Commander Markham and some of the officers of the *Alert* for a quarter to ten next morning, on their own vessel, that time being fixed because they would then all be there ready to receive the Lords of the Admiralty, who were to come on board at ten o'clock to make their final inspection. That was all I could arrange. But the day's troubles were not over, for we suddenly learnt that the premises in which we had our dark room would be closed on the morrow, because it would be a general dockyard holiday. We were also confidentially and confidently informed that it would be sure to rain all day—that it always did on dockyard holidays; and, from my experience of Portsmouth weather, I fully believed it.

We found another dark room, and next morning, which was cold and dull—more like March than May—we got to work early, to secure another view before the officers' group. This view took the bows of the *Alert* and of one the large troop-ships, and also, in the distance, Nelson's old ships the *Camperdown* and the *Victory*. While preparing the plate for this, the man in charge of the premises came down to our dungeon, saying he had had an accident and broken a piece of glass; he hoped it was of no consequence. Alas! the focussing-screen was in many pieces; however, we managed to patch up three-fourths of it with strips of dextrined paper, and made it just usable.

Well, having taken the *Camperdown* and the *Victory*, I now boarded the *Discovery*, and, finding Captain Stephenson, succeeded in making an engagement for eleven o'clock. It was now time to be off to the *Alert*. There we found the decks clear; the sailors were below dressing for inspection, and Commander Markham the only officer to be seen. Gradually, by five minutes to ten, about half-a-dozen more made their appearance, when he said, "Now you must be content with us who are here." Then, just at the right moment, Captain Nares arrived, with some other officers; and although he had not previously been asked, he very kindly fell in with the rest; and in less time than it takes to tell, we had exposed two plates; and, thanking them and wishing them every success, we were off the vessel before the clock struck ten.

We were at the side of the *Discovery*, with two plates, before eleven o'clock, and in time to see the Lords of the Admiralty inspect the crew. After a speech from the First Lord, and a cheer from the men, off they came and on went we, and the gangway was closed against visitors. "Now," said Captain Stephenson, "make haste! make haste! crew and all." So the men were piped aft to make one group of officers and men together. But there was not room enough, so "The sailors first," said the Captain;

but they had to stand and sit so close, and they were so jolly after the speech from the First Lord, that there was no doing anything with them with one plate; for as soon as the cap was off, one of them—the Joe Miller of the crew—said something which made them all shake with laughter, and quite spoilt the group.

The officers stood fire well; and I believe the group contains a portrait of every officer belonging to the ship. As we left the vessel, a crowd of friends (chiefly ladies) passed on board to say farewell. I must have appeared sadly in the way, for I had been keeping them waiting.

SPECTRUM PHOTOGRAPHY.*

BY CAPTAIN J. WATERHOUSE, R.E.

(Assistant Surveyor General of India).

The spectrum may now be focussed on the focussing screen in the usual way. The ordinary ground glass is generally too coarse for focussing the finest lines with sufficient accuracy, and a good plan is to put a plate with an exposed and developed collodion film into the dark slide and focus by the aid of a magnifying glass; and if the plate is moved up and down slightly, as recommended by Dr. Van Monckhoven, the lines will be distinguishable with the utmost possible sharpness. It should be observed that in photographing spectra of long extent there will be some difficulty in focussing the lines of the whole spectrum equally sharp, and therefore, when it is an object to have the most perfect definition of the lines in any particular part of the spectrum, care should be taken to focus on prominent lines in that part; and it is also necessary that the condensing lens and collimator lens should be focussed for the particular portions of the spectrum which it may be wished to photograph. The photographs can then be taken in the usual way, the light being admitted or shut off by means of a cap in front of the slit of the spectroscope. If a mirror worked by hand is used, care must be taken to keep the image of the sun well on the slit throughout the exposure. If it is desired to take several spectra on one plate, it may easily be done by raising the dark slide by means of blocks of wood of different thicknesses, care being taken to stop the light from entering the camera from below.

Dr. Vogel, of Berlin, has described a very useful little spectroscope camera, very cheap and well adapted for experimental work in photographing the spectrum and many scientific applications of spectrum photography; and he has kindly had one made up for me. It has been fully described in vol. xix., page 476, of the News for the year 1875; and consists of a small camera, extending from six to nine inches in focus, furnished with one or more dark slides taking quarter-plates. A flexible sliding front, in the middle of which is a vertical slide, carrying a small direct-vision spectroscope, enables the latter to be moved in any direction, up or down, right or left. There is no lens, and focus is obtained by drawing in and out the tube containing the slit, which slides over the tube containing the prisms and collimating lens; the fine definition of the lines being regulated by the width of the slit, which Dr. Vogel has made with a little adjustment, so that the knife-edges may be inclined to one another, and the slit made wedge-shaped instead of with parallel sides. This little instrument can be carried in the hands, and pointed direct at the sun with sufficient accuracy during an exposure of even some minutes' duration by keeping the base of the spectroscope exactly in the middle of its shadow thrown upon the front of the camera. With this apparatus, four or five separate pictures of the spectrum may be taken on the same plate by shifting the flexible front so as to bring the spectroscope in front of an unexposed part of the plate; and it is, therefore, well adapted for comparative observations of the intensity of light at different hours of the day, and many other similar purposes for which fine definition or great dispersion is not essential. It may also be used with the mirror and condensing lens, as already described.

These arrangements, with a direct-vision spectroscope, are the most simple and economical, and, for most purposes of the photographer, all that is necessary. If, however, better definition and a more intense spectrum are required, it will be found advisable to use the other form of spectroscope with one or more separate prisms of dense flint glass mounted in the usual manner on a circular table supported on a central pillar. In this form of spectroscope the refracted ray emerges from the prism or prisms in a different direction from that in which it enters them, and a little arrangement is therefore necessary, so that the image of the spectrum may fall into its proper place in the camera.

As a single good prism is sufficient for most purposes of the photographer, I shall confine myself to the description of the adjustment of a single prism spectroscope. For working with many prisms, the use of a spectroscope furnished with an automatic arrangement by which the prisms are always at what is called the angle of minimum deviation for any particular ray, or an apparatus specially constructed for the purpose with a camera attached to the spectroscope, will be found more convenient.

First of all, if not already done, the prism must be adjusted to the angle of minimum deviation, so that the beam of light falling on the outer surface of the prism or series of prisms (commonly called a battery) may be refracted through them so as to leave them at exactly the same angle as it entered. This is effected by placing the observing telescope in such a position that the spectrum can be seen, and so that the rays for which minimum deviation is required are in the centre of the field. Now turn the prism on its own axis so as to vary the angle which the front surface makes with the incident ray of light. If the spectrum moves towards the blue end it shows that the prism must be turned in the opposite direction, when the whole spectrum will close up towards the red end. On continuing to turn in this reversed direction, the spectrum will again move towards the blue end, and the angle of minimum deviation will have been passed. There is, therefore, one point at which any particular line is as near the red end of the spectrum as it can possibly be, and on turning the prism in either direction, the line will shift towards the blue; when the line is stationary it is at the angle of minimum deviation. In working on the red end it will be sufficient to thus adjust the prism for the D line, and on the blue end for the line F, or the H line, if visible.

The instrument, being adjusted at the proper angle of minimum deviation for the part of the spectrum under study, is placed so that the tube carrying the slit and collimator may be in the direction of the beam from the mirror or heliostat, as explained before. A camera and lens are then arranged on the other side of the prisms, so that looking from the back of the camera through the lens in the direction of its axis, the prisms may be seen in a central position, and the image of the collimator lens nearly the middle of the prism. The image of the spectrum can then be examined on the focussing screen, and if not quite in its proper position in the centre of the screen, can be brought into it by raising or lowering the camera, or turning it a little to the right or left. When a hand mirror is used, the camera may be mounted on a strong table stand, and the adjustment made by moving the spectroscope and mirror. The camera may be fitted with any convenient lens, recollecting that the longer the focus of the lens, the wider and longer will the spectrum be; but with a corresponding loss of intensity and brilliancy. The object glass of the observing telescope may be also used in place of a camera lens for throwing the image of the spectrum upon the focussing screen. In this case the eye-pieces are removed from the telescope, and the tube is passed into the camera, being wrapped round, so that extraneous light may not fall on the sensitive plate. The other arrangements for placing the mirror, condensing lens, slit, and collimator, in the same straight line, with their centres on the same level, and for focussing, are the same as when using a direct vision spectroscope as already described. It will often be advisable to use a camera fitted with a swing back, so that the part of the plate on which the blue or more refrangible rays fall may be brought nearer the lens, and more equal definition obtained over the whole length of the spectrum.

The above are some of the arrangements that will, I think, be found most convenient for general purposes, especially as they do not require other appliances than are well within the reach of the photographer. For special objects more perfect and complete arrangements, and the use of quartz prisms and lenses, will be necessary; but a description of these, as well as of the arrangements for photographing the diffraction spectrum, are out of the scope of the present notice, which has already exceeded the usual limits.

In conclusion, I would refer those who wish to know more on the subject of spectroscopes and spectrum analysis, to Mr. Norman Lockyer's little work on the spectroscope, published by Macmillan in the *Nature* series; and to the well-known text-books by Roscoe and Schellen. For information on spectroscopic photography and some of the results it has yielded, Dr. Vogel's late papers published in the English photographic journals, and papers by Mr. Crookes in some of the early volumes of the *Photographic Journal* and News, as well as those by Sir John Herschel in the Philosophical Transactions of the Royal Society for 1840; that by Dr. W.A. Miller, reprinted in vol. xviii. of the News; and Dr. J. W. Draper's papers in the *Philosophical Magazine*, 1841 to 1845 and 1851, may be studied with much advantage.

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* Continued from page 14.

The Photographic News.

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PHOTOGRAPHY AT THE FORTHCOMING INTERNATIONAL EXHIBITION AT PHILADELPHIA.

All intending contributors to the photographic department of the forthcoming International Exhibition to be held in Philadelphia during the ensuing summer have, it is to be presumed, made application for and received their allotment of space some time ago. Nevertheless, if there are any who have failed to do this who can still be induced to send worthy examples of English photography to America, we have authority for saying that although the time for making application is passed, the English Commission will not rigidly abide by the rule which excludes applications after the date first named, and a prompt application, we have reason to believe, will receive a favourable response.

There is no time, however, now to delay, as the time for transmission of contributions has now arrived. The time required for transit cannot be reckoned as less than a fortnight, and everything must arrive before the 19th of April. This, of course, leaves fully two months before it is absolutely necessary to despatch contributions, but the commissioners advise intending contributors not to delay; but to send off their cases as early in February as possible. Full details of the regulations for freight, delivery, &c., may be obtained at the office of the Commission, 5, Craig's Court, Charing Cross, and as safety to the goods, as well as facility in their arrangement by the authorities, will depend much on the precise attention to these instructions, it is important that contributors should secure them without delay, and carry them out with precision and accuracy.

These instructions afford full information as to the means of transit, mode of packing, delivery at the exhibition, arrangement there, and provisions for return, Customs' arrangements, the information to be transmitted with each consignment, and various other details. They also contain a list of agents in this country who have been accredited by the Commission to undertake the charge of transmitting goods, and from this list intending contributors will be enabled to select an agent. There are the names of many well known carriers in the list; but we may possibly serve some of our readers if we mention the name of H. Starr and Co., as a firm, within our knowledge, accustomed to the especial care of parcels as well as goods of large bulk.

It seems somewhat a pity, since a special building in the exhibition grounds will be devoted to photography, under the direction of a committee of photographers in the United States, who have undertaken the duty, that some arrangement should not have been made in this and other countries to have sent out the whole of the photographic contributions in one consignment to the photographic committee of the exhibition in Philadelphia, a course which would have secured greater certainty and safety, involved less trouble, and hence, probably, would have ensured a greater number of contributions. Unfortunately, the machinery for securing such arrangement does not seem to exist, and the matter must rest on individual effort and enterprize. Possibly, under some circumstances, the direct provision of facilities for such a general contribution might well be undertaken by the Photographic Society.

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COMPETITION OF DRY PLATE PROCESSES.

The French Photographic Society has issued the following regulations in respect to this competition:—

A prize of five hundred francs will be awarded to the author of the best process of obtaining clichés by means of dry films. The desideratum will be a preparation capable of keeping good as long as possible, and which, poured upon a glass or less weighty and fragile support, will permit of obtaining, by simply drying, and without washing, a film as sensitive and perfect as that of wet collodion.

In case the conditions may not be perfectly fulfilled, the prize will be given, either in one sum or in parts, to those who approach nearest to the object desired.

The competition is International; the only exclusions made will be the members of the jury, the president, vice-presidents, and council of the French Photographic Society.

The jury charged with the award of the prize will be chosen by the French Photographic Society at their November or December meetings, 1876, and any intending competitors may withdraw if elected.

The competition will commence at the date of the election of the jury, and close on the 1st of January, 1877. All communications must be forwarded before this date to the Secretary of the Society, 20, Rue Louis-le-Grand, Paris.

All contributions must be composed of at least six prepared plates, not less than eighteen by twenty-four centimetres, together with 250 cubic centimetres of the product which has served for their preparation. Further, written directions must be sent respecting the mode of operating and preparation; the whole in a sealed packet, bearing the name and address of the candidate.

The opening of all packets, boxes, &c., will be made in the presence of the candidates or their agents, or after a fortnight's notice has been given by a letter sent by the Secretary of the Society.

The candidates must themselves operate in the presence of the jury under certain fixed and similar conditions previously determined, or if it is impossible for them to be present they must communicate in respect to any experiments that the jury may desire to have carried out.

The jury will have the right of demanding supplementary materials or information, but the candidate has no right to insist upon any further tests they may desire made.

The work of the jury shall not commence before two months have elapsed after the closing of the competition, and the report shall be made in the month following that in which the last experiment was made.

The nature of the process chosen, and the explanation of the jury, shall be published at the same time that the decision of the jury is made known.

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MEDALS FOR PHOTOGRAPHIC RESEARCH.

It is well known that the Vienna Photographic Society offer nearly every year medals to be competed for among its members. The principal of these awards is a gold medal, the proceeds of a sum of money presented to the Society by Herr von Voigtlander to encourage photography.

This gold medal, as well as certain silver and bronze awards, can only be received by a member of the Vienna Photographic Society, and therefore foreigners are ineligible for the honour unless they qualify themselves in the first place by becoming members.

The Council of the Vienna Society, we are glad to see, now propose to give a series of gold and silver medals which shall be open to the world, and in the last number of the Society's organ—the *Photographische Correspondenz*—there are given the objects for which such medals are to be awarded.

We insert the programme in full, although it is only for the second series of medals that non-members of the Society can compete:—

No. 1 Series.

1. A gold medal of the weight of 140 ducats for a wet-plate process of increased sensitiveness.
2. A gold medal of the weight of 140 ducats for a dry process which combines sensitiveness with certainty.
3. A silver medal for a collection of studies of nature, specially valuable to the artist.
4. A silver medal for a collection of instantaneous stereoscopic slides.
5. A silver medal for a collection of lantern transparencies of a scientific or technical nature.

No. 2 Series.

1. A gold medal of the weight of 140 ducats for a process for producing relief and intaglio plates with half-tone by means of photography.
2. A gold medal of the weight of 140 ducats for a critical research into the reactions of chromic acid and its salts upon albuminates, albumenoids, and carbo-hydrate, with particular reference to heliographic printing.
3. A silver medal for a collection of carbon pictures printed in Austro-Hungary.
4. A silver medal for *genre* pictures.
5. A silver medal for pictures of monuments.
6. A silver medal for a collection of ethnological studies.
7. A silver medal for a collection of anthropological studies.

So far as it has been determined, competitors must send in their work to the Vienna Photographic Society during the session of 1876. Further details will, however, be furnished by the Society before the details of the competition can be looked upon as definitely settled.

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WASHED AND UNWASHED EMULSIONS.

An interesting illustration of the effect exercised by washing emulsions, so as to remove the soluble salts formed by the double decomposition of the nitrate of silver and the bromide salt employed in forming the bromide of silver, is given by Mr. T. C. Roche in a communication to the Photographic Section of the American Institute. A sample of the emulsion, which was working well, was divided into two portions, to be kept twelve months before further trial. We will, however, allow Mr. Roche to tell the story. He says:—

"I divided the emulsion into two equal portions, one half being labelled with date and put away from the light, the other half I washed in the following manner: Taking a deep porcelain dish, half filled with distilled water in the dark room, I poured the bromide emulsion into it. The emulsion soon clotted up. After stirring it well with a glass rod, draining the water off, and washing again in a few changes of water and draining, I squeezed all the water out, broke up the cotton, and set it away to dry. When dry, I mixed with equal portions of ether and alcohol, so as to give a good, flowing film; after filtering I found it to work quick, clean, and brilliant. This bottle I also put away.

"On my return, after an absence of twelve months, I found the unwashed emulsion on trial to fog a little, and not so sensitive. In the bottle of washed emulsion I found a perfectly clear liquid, with a fine white sediment at the bottom. Shaking it up well, and after allowing the bubbles to subside, I tried a plate, and found it had lost none of its original good qualities, and developed free from any kind of fog.

"The addition of a few drops to the ounce of emulsion of an alcoholic solution of hops, boneset, liquorice, or any organic matter soluble in alcohol which is also soluble in water, will act as a preservative on the plates, but in a week's time it seems to affect the emulsion in the stock bottle.

"The emulsion was made in the following manner:—

Ether	8 ounces
Alcohol	6 ,,
Bromide ammonia	112 grains
Anthony's sol. cotton, No. 1 ...	112 ,,

After a good shaking I added, in two ounces of hot alcohol, 240 grains of nitrate of silver, shaking up well, and the next day I added a quarter ounce of iodide solution (alcohol one ounce, iodide of ammonium fifty grains), shaking well and filtering a little before trying a plate. If it showed any sign of fog, I added a few drops more of the iodide solution. This will bring the emulsion all right. If there is too much iodide in, a fine granular deposit will be seen on the sides of the bottle. A drop or two of silver in alcohol will take this all up."

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FRENCH CORRESPONDENCE.

Printing with Platinum Salts—Enamelling Iron Baths for Carbon Printing—Photography and Astronomy—An Observatory for Students—M. E. Boivin's Dry Process.

A practical demonstration of the process of printing by means of platinum salts, which was brought forward by Mr. Willis, took place at the meeting of the French Photographic Society on the 7th of January. Mr. Stebbing conducted the operations, and the cliche employed was one lent by M. Davanne for the occasion. It was a very old negative obtained by means of the Taupenot process, and possessed not only a very dense film, but one of a dark yellowish tint. As the meetings of the society are held in the evening, Mr. Stebbing had taken the precaution to print the impressions he required during the daytime, so that he might develop them at night. His printer had begun work at nine in the morning, and continued till four in the afternoon, and this interval sufficed to print eight copies. M. Davanne was of opinion that on such a wintry day he could not have obtained more than one print from the negative with chloride of silver paper. There is, therefore, a superiority in the new paper as regards sensitiveness.

Mr. Stebbing began by exhibiting to the audience a specimen of the paper upon which the prints had been produced. It was ordinary Saxe paper, coated with arrowroot to prevent the solutions from penetrating too far into the substance of the paper. To sensitize the same, it was floated for some seconds upon a silver bath of 2 per cent. strength. When dry it was placed in a flat position by means of pins at the four corners, and upon it was poured a small quantity of a mixture of oxalate of iron and chloroplatinate of potash. This liquid was uniformly extended over the whole surface by means of a sponge, or a bit of flannel. To dry it again, the paper was held before a brisk fire; it was then cut into pieces, and put into the printing frames.

After having detailed these preliminaries, Mr. Stebbing showed the prints which had been prepared during the day. On quitting the printing-frame, the impression is scarcely visible. The platinum salt has not undergone any alteration, but a chemical change has taken place in the iron salts, the ferric oxide having been transformed into ferrous oxide, in proportion to the action of the light. Now, in the presence of oxalate of potash, the ferrous oxalate has the property of precipitating the metal in chloride of platinum. Mr. Stebbing demonstrated this by heating in a vessel a solution of oxalate of potash, and plunging the prints into it. In contact with this solution, the salt of platinum was immediately transformed into metal, proportionately to the amount of ferric oxalate changed into ferrous oxalate, the image appearing at once in all its details.

The print being thus developed, the demonstrator passed it into a weak solution of oxalic acid, the effect of which was to dissolve the remainder of the ferric oxalate contained in the paper so as to produce perfectly pure whites in the prints.

The print once washed may be said to be fixed. It does not, however, present to the eye a very agreeable tone, and it can be toned in a bath of sulphocyanide of gold. The small amount of silver which enters into the composition of the picture facilitates very considerably the toning process. Finally, the image is plunged into a bath of hyposulphite of soda, which frees it from all trace of soluble salts of silver and platinum. A thorough washing follows, which should be repeated several times.

It was remarked by many around that the process bore a great analogy, so far as the operations were concerned to that of iodide of silver. The main thing to be known in connection with the process is whether the pictures produced are permanent; it is time alone which can solve this problem.

M. Audouen has presented the Photographic Society of France with some baths of enamelled sheet-iron, suitable for carbon printing, or for any other photographic manipulations. They are very solid, and at the same time exceedingly light: they possess, moreover, the advantage of being able to resist heat.

Photography occupies an important place in the *Annuaire du Bureau des Longitudes*, which has just appeared. In the first place MM. Janssen et Mouchez, the principals of the scientific expeditions to Japan and the Island of St. Paul, render an account of their work, in which photography had a large share. In the communication of M. Janssen we find a description and woodcut of the ingenious instrument which this eminent astronomer employed for taking successive images of the sun, which he calls a *Revolver Photographique.*

It is generally known that an observatory is being built in the Parc Mouceau in Paris for the *Bureau des Longitudes*. Into this observatory will be received, for instruction, those who prefer the request, and are found qualified to profit by the teaching which will be given by our most able astronomers. Two special observatories will be annexed, the first for officers of the navy, and the second for army officers. Among the apparatus to be employed by the students figure many photographic instruments, for the regulations relating to the instruction of aspirants say, "they will practise photography, of which much valuable application is made in astronomy, and which, at the same time, may render great service to navigation.

The publishing firm of Gauthier Villars has just published a second edition of M. E. Boivin's "Manual on Dry Plate Photography." The author has added to his own formulæ those of the late Thomas Sutton, which he has employed with success. He has also added a very succinct and practical study of the process of printing with inert powders, together with some remarks on photo-lithography and printing in fatty inks. The volume is, therefore, well filled, and will answer most completely the wants of photographers.

It is now twenty years since M. Boivin first practised his method of dry plates described in the work we allude to. The principal points connected with it are:—

1. Addition of nitrate of silver to the collodion.
2. Sensitizing the film with a solution of iodide and bromide.
3. Application of albumen containing glucose, iodides, and bromides.
4. Re-sensitizing of the aceto-nitrate.
5. Development with gallic acid.

M. Boivin has calculated that the time of pose with a landscape lens carrying a little diaphragm, and having eight centimetres focus, is one minute; we see, therefore, that M. Boivin is a man of some precision.

Ernest Lacan.

PRACTICAL NOTES ON VARIOUS SUBJECTS.

A Process on Painter's Canvas by Development—A Simple Manner of Printing Medallion Carbons—A White Light for Dark-room Windows.

BY CHARLES WALDACK.

A Process on Painter's Canvas by Development.—The process I intend to give I have practised for fifteen years with great success. During that time I made several thousand enlarged prints on canvas for photographers and for painters, and never have I had any complaint from fading or scaling off. The process is one by development, iodide of silver being used as the haloid salt, and it is a fact well known that prints made by a process of that kind possess a much greater stability than those obtained by direct printing. My first attempts were made with albumen as a vehicle for the iodide. It was found, however, that the film would scale off under the painter's brush. For albumen I substituted gelatine, and the evil was removed. The layer of gelatine on the surface is very thin, the solution used not being any stronger than six grains to the ounce. The canvas with which I succeeded best is Winsor and Newton's smooth. It should be of recent manufacture, old canvas having generally oily spots, which, not taking the solution well, will show in the print. The operations are as follows:—Cleaning of the canvas, iodizing, silvering, exposing, developing, fixing, and washing.

Cleaning of the Canvas.—The cleaning of the canvas can be done in two ways: by rubbing the surface with a piece of Canton flannel wetted with alcohol, or washing it with a sponge and soap-water. In making use of this last means great care should be taken not to remove the paint. The soap should thus not be strong, the sponge soft, and the pressure slight. The canvas should then be rinsed off, and is ready for the iodizing solution.

Iodizing.—The iodizing solution is made as follows:—

Cox's sparkling gelatine	½ ounce
Water	40 ounces
Iodide of potassium	½ ounce
Bromide of potassium	¼ ounce

For very thin negatives, such as are made for direct solar camera printing, add ¼ ounce chloride of ammonium. The addition of a chloride increases the exposure, thus making it more manageable, and gives a greater vigour to the print.

The, gelatine is left to soften in the water, after which it is warmed. The solution is then filtered through a piece of muslin in a pitcher. It should be applied hot, and this operation should be done in a warm room, free from draught and dust. When the canvas has been cleaned by washing with soap and water, it is only necessary to flow the gelatine solution twice over the wet canvas, after which this is set up to dry. If the canvas has been cleaned with alcohol, the gelatine should be rubbed on it with a flat hard brush, and, when it has taken hold in every part, a fresh quantity is flown over to remove air-bubbles.

The canvas should be watched while it dries, for every irregularity will produce a defect in the print. As prints on canvas are to be painted, however, a defect in the background or dress is of little consequence.

Silvering.—The canvas being dry is ready to be silvered. It should not be kept longer than a day or two before being used. The silver solution is composed of—

Nitrate of silver	1 ounce
Water distilled, or ice... ...	24 ounces
Nitric acid	One or two drops.

Old collodion silver baths, diluted to the proper strength, can be used with advantage. The canvas, which is on a square stretcher, is clamped to a wooden frame. This frame is about one inch thick, and should be about three inches high. It is covered on its edges with strips of rubber, so that when laid on the canvas, and fastened to it by means of wooden clamps, a dish or tray is formed, which will hold the silver solution without leaking.

The tray is tilted to an angle of 45°, the silver solution is poured in the lower part, and, by bringing it back to a horizontal position, the solution is made to flow over the canvas. Flow forward and back for two or three minutes, pour it, and you are ready for the exposure.

Exposure.—The image has been set in focus on the canvas before it was silvered. The silvered canvas is now put in the same place, the sun turned on, and the lens uncovered. The exposure may vary considerably, according to the intensity of the light, the size of the condenser, the intensity of the negative, &c. From half a minute to five minutes may be given. The image should be slightly visible. With a strong negative it should be more visible than with a weak one, and when chloride is added to the iodizing solution it should be more visible than if iodide of bromide alone is used.

The Development.—Make a saturate solution of gallic acid in water, add one ounce to forty ounces of Beaufoy's acetic acid, and dilute with an equal quantity of water. Begin the development with this. If, by the way it proceeds, you see that the exposure has been short, add a few ounces of a two-grain solution of pyrogallic acid, acidified with the usual quantity of acetic acid. If the exposure has been too long, a few drops of a saturated solution of citric acid will retard the development, and save the print. The image being fully developed, pour over a weak solution of salt, remove from the frame, and wash.

Fixing and Washing.—The fixing is done with a 10 per cent. solution of hyposulphite, which is flowed forward and back. The canvas is then washed under a tap for fifteen or twenty minutes, taking care not to wet the back. No toning is required. If the exposure has been right and the development conducted properly, the whites will be clear, and the blacks of the proper density. Over-exposure produces a grey picture; under-exposure, a hard one.

Remarks.—In cold weather be careful to keep the silver and developing solutions at about 60° in warm weather; it is impossible to be successful unless these solutions are cooled by means of ice. An under-exposed picture is generally powdery, and can be partly brushed off. To make use of it, flow it while wet with a one-grain solution of gelatine.

A Simple Manner of Printing Medallion Carbons.—The outside mask, that which is to cover the border, instead of being fastened to the negative with paste or glue, is stuck at the four corners with a very small quantity of the rubber cement, which is sold in rubber stores contained in tin boxes. This is simply rubber which has been softened by means of benzole or turpentine. The print is then made, and the carbon tissue is stuck to the black paper mask by wetting the four corners very slightly, just sufficient to procure adherence. After a few minutes the tissue, with the mask adhering, is taken out, and laid down mask upside on a plate of glass. The rubber cement being fresh, the mask will easily leave the negative and adhere to the tissue. The inside oval, that which is to cover the picture while the border is printed, is now laid down in its place, and fastened at the top and at the bottom by means of a little of the rubber cement; the outside mask is taken off, the tissue is covered with a glass plate, and the border is printed. As I have recommended in a former communication, it is best to cut the outside oval out of dry paper, and the inside one out of wet paper. The inside mask, shrinking, will fit loosely in the outside mask, and a small black edge all round will be the result, instead of the disagreeable white edge on one side.

A White Light for Dark-room Windows.—At the last meeting of the Ghent Section of the Belgian Society Dr. Van Monckhoven communicated a very interesting, and curious fact. Having to darken a room in which to dry carbon tissue, and having nothing on hand but red and green glass, and not enough of either to cover the window entirely, he used half of each, alternating it. The result was that at a certain distance from the window the red and green lights blended together and formed a white light. This white light has no action on the sensitized carbon tissue. If it should have no action on the sensitized collodion plate it would be excellent to illuminate our dark rooms. If there should be no difficulty in procuring red and green glass which would transmit no rays having a chemical action, a window might be fitted alternately with red and green panes of small size.

MR. NEWTON ON EMULSIONS.

In a communication to *Anthony's Bulletin*, Mr. Newton, in concluding an article on Emulsions, says:—"I do not suppose that ultimate perfection has been reached in this process. When, however, we can produce a satisfactory emulsion of perfect keeping qualities with the preservative in combination with it, so that we have only to flow the plate and let it dry, we shall have approximated very near to perfection. This has been successfully accomplished by Mr. G. P. B. Hoyt, of Brooklyn; at least, he so assures me. Mr. Hoyt is one of our most intelligent and successful amateur photographers. He is by profession an analytical chemist. He has been using my emulsion during the summer with the most satisfactory results. The preservative which he uses is compounded as follows: To one ounce of alcohol add one tablespoonful of Japanese tea; let it stand a few days, and add half-an-ounce of tincture nux vomica, half-an-ounce of laudanum, and sixty grains of tannin, or thirty of tannin and ten of pyrogallic acid. When the emulsion is in good working condition, add five to ten drops of this compound to the ounce. Mr. Hoyt assures me that my emulsion so preserved is much more sensitive than the ordinary wet process—in fact, requiring less than half the exposure. All that is necessary in preparing the plates is to flow them with the emulsion, and set them away to dry. I hope, on trial, that all he asserts will prove to be true. I made several trials in the early part of the summer with preservatives in the emulsions, but with unsatisfactory results. I am, however, satisfied from Mr. Hoyt's statements, that the reason why I failed was in over-exposing my plates. I had intended to take up that branch again, but hope Mr. Hoyt has saved me the trouble. I will close this long letter by giving my last formula; it will prevent any further complaint of fog, as the chloride is added before the foggy point is reached. To three ounces of a twelve-grain bromide of cadmium collodion add fifty-one grains of finely-pulverized nitrate of silver, dissolved in boiling alcohol, as previously given; shake well, and in six hours add six grains of chloride of cobalt, dissolved in alcohol. For preservative, take twelve ounces of water; add one drachm each of the following: syrup of squills, tincture of nux vomica, and laudanum. An ounce or two of alcohol facilitates the drying, and is, therefore, advantageous. Any one in trying this process can experiment on preservatives; but I hope they will not condemn the process without trying the one given above.

I forgot to give Mr. Hoyt's method of preparing this albumen, which is as follows:—

Water ... ... 16 ounces
Albumen of one egg.
Iodide ammonium, four grains to the ounce.

Add a small piece of gum camphor to prevent moulding. I apprehend that the increased sensitiveness which he obtains is due, to a certain extent, to the iodide salt in the albumen solution.

Correspondence.

CARBON *VERSUS* SILVER.

Sir,—The days of prints on albumenized paper are, I believe, numbered. That such proofs do fade few will be disposed to deny; whether they *must* fade, I think, is sufficiently answered in your excellent leader in last week's News. The sulphur compounds, arising from the constant use of gas in our apartments—not to speak of sulphur in the albumen on paper—and those emanating from the combustion of coal in open grates, are sufficient to set up a destructive force in delicate silver films, and in a sensitive metal so finely subdivided, and in a layer so subtle as to act almost as a test of the presence of sulphur.

The questions, then, which concern professionals to ask and answer, are these: Are we to have permanent photographs, in which the public can confide, and which they have a right to demand, or is a photograph to be a mere ephemeral toy to charm for a moment—say even for a few years—and then to be cast aside as a faded and useless thing?

Sir, I hope better things of the enterprise and conscientiousness of the profession, and I think it only needs to be impressed upon this intelligent class that carbon printing is not now the mystery and impossibility they may once have imagined. Intricate and difficult as it may appear at the first blush, and from written description only, and so different from all their experience in silver printing, a few lessons from a carbon printer will dissipate their doubts, and clear away all their difficulties, with the exception, possibly, of the proper time of exposure; this, of course, will readily be ascertained by practice.

The artist in carbon has a system which enables him to obtain proofs with a surface like glass, or matt, or with a gloss equal or superior to the best albumenized paper at will, according to the substratum on which the picture is developed, or to the method of mounting it, and with a rapidity three-fold exceeding that of silver.

And here, be it observed, we have no doubtful silver sensitizing solution, no refractory baths refusing to tone, no mealy prints, no impracticable albumenized paper, but simple baths of warm and cold water, a bichromate sensitizer, a solution of alum, transfer paper, and some minor appliances, which will soon become household words to the printer.

The instructions given in the fourth edition of the Autotype Manual are so simple, and yet so full, that anyone who has, or indeed who has not, been exercised in silver printing, should, by means of it, be able in a short time to make himself master of the imagined intricacies of printing in pigments.

The specimens I have examined of Lambertype have not only all the merit of silver proofs; they have in addition a delicacy of definition and (if I may use such an expression) a lusciousness in the shadows far surpassing any I have seen on albumenized paper.

I may, perhaps, be allowed to remind such of the profession as may not be inclined to invest in the Lambertype patents or amateurs, who hesitate to indulge in such an expensive luxury, that the Autotype Company, with great liberality, allow the public the free use of their patents, on the sole condition that the necessary materials be purchased at their establishment.—I am, sir, yours truly, R. M. S.

A WORD ON ALBUMEN.

Dear Sir,—Will you allow me, through the medium of your valuable paper, to say a word about albumen?

Albumen, as we all know, is an organic principle found both in the animal and vegetable kingdom. Its properties are best studied and used in the white of an egg. (Would it were so!) The motto in the Year-Book comes in very fitly, "Give me an egg." The albumen in the egg is a very pure form. Albumen is capable of existing in two states, in one of which it is soluble, in the other insoluble, in water. The aqueous solution of the soluble variety gives a slightly alkaline reaction to test-paper. It is somewhat thick and glutinous, but becomes more fluid on the addition of an lkali, such as ammonia. Soluble albumen may be converted into the insoluble form in the following ways; viz., by application of heat; 2nd, by addition of acids; 3rd, by metallic salts. The white precipitate form on mixing albumen with nitrate of silver is chemical compound of animal matter with oxide of silver, and is called albumenate of silver.

Its chemical properties make it valuable to the photographer. One very serious drawback to its use is the difficulty of entirely removing the silver salt from it, by any fixing agent. Hence such prints are liable to fading, even if other causes are removed.—I remain, yours truly,

Grafton Underwood, Kettering. C. R. P. Vernon.

A SPLIT SHADE.

Dear Sir,—Having read many articles on the most simple and yet effective split shades, I find that all, more or less, require something made specially. Now, at the expense of raising a laugh, I will tell you the shade I use; it is always *handy*, never lost, and is fitted in a moment; costs nothing, and is ready made; viz., the five fingers of my own hand. I can vary the shape and position in any manner. Unless very unsteady and groggy, there is less chance of a shake than in turning the nut of a fixed shade.

A dark glove might be worn. For long exposures, I slip an elastic band round the lens, and under it slip a piece of black card, bent over the front of the lens and shaped as necessary. However, this can be lost; fingers cannot.

I cannot claim the invention of fingers, so I won't patent the idea. It is almost too absurd in its simplicity, but it is effective, so "Fingers before Forks."—I remain, yours truly, R. A.

M. LAMBERT'S PATENTS.

Sir,—Twelve months ago we were waited upon by M. Lambert, who asked that we should give him certain facilities in teaching and working in this country some improvements he had made in carbon printing. The specimens he placed before us were very good, and equalled, if not surpassed, the finest possible silver prints. To M. Lambert's request we replied that we would afford him what help we could, and that under certain conditions his pupils or licencees should be allowed to practise any of our patents for double transfer without hindrance or molestation from us.

Since then M. Lambert has been very active and very successful in demonstrating his processes, and has induced many of the best photographers in the country to become licensees; moreover, the commercial value of the processes has now been settled without dispute. Until recently, the cost of a license from M. Lambert was comparatively small, but the price has since been raised, and there was every probability of a still higher charge being made.

Convinced, as we were at first, of the merit of M. Lambert's method, and that conviction much strengthened by his great success, we felt it to be our duty to step in, and, if possible, prevent any action being taken which might tend to circumscribe the area of printing in permanent pigments by setting up anything approaching to exclusive rights. We have, therefore, purchased (subject to rights already granted) the whole of M. Lambert's interest in his patents, processes, and methods of working in Great Britain, Ireland, Australia, and India. We have also secured for a short time the valuable services of M. Lambert to demonstrate his processes under the most favourable conditions at our Autotype Works, Ealing Dean.

Whatever question there may be as to the validity of M. Lambert's patents for printing in carbon, there can be none, we think, as to the value of the original patents held by us, and to which M. Lambert's are clearly subject. In order, therefore, to put that gentleman's licensees in a secure position, we propose to issue to all who apply to us a formal license to work all the processes of double transfer under our original patents. By this step we give our appreciation of the practical and commercial value of the improvements made by M. Lambert, and recognise in him a valuable and able coadjutor.

Whilst the best method of producing good work suitable for the profession generally was not fairly settled, but in an experimental stage, we were content to allow the free use of our patents to all who chose to work in this new branch of photography, upon very simple conditions. As we are now in a position to give full instructions, and to point out a method which, whilst being exceedingly profitable to those who adopt it, will raise the status of photographic work generally, we feel it due to ourselves to abolish the system of gratuitous instruction, and for the future to grant licenses under our patents for the right to make photographs in permanent pigments. Considering that a sum of from £25,000 to £30,000 has been spent in perfecting so far the system of autotype printing, we are quite of opinion that the time has come for a reasonable remuneration to accrue to those who have spent their money, their time, and their best energies in this enterprize.—We are, yours truly,

The Autotype Company.

Autotope Works, Ealing Dean, January 19.

PHOTOGRAPHING THE CORONA.

Dear Sir,—The writer of the article in the News of the 14th inst., on photographing the spectrum of the corona, will, perhaps, allow me to point out that the bright part of the corona can be photographed in a very short time—probably in one second. The picture referred to as having been done in Sicily in eight seconds shows the corona more extended than any other yet taken; but it is just possible the coronas of eclipses since 1870 may not have had the same extension, or the difference may arise from the varying methods of the observers. Some of the negatives have had over twenty seconds' exposure; but this, instead of showing more of the corona, has seemed to obliterate the more delicate outer rays.

It seems to me that the matter in question is, whether the operation of the corona *in all its details* can be photographed; and in this I agree with your correspondent, that it is unlikely it ever will be done.

So far as one can learn from Dr. Schuster's letter, *something of value* was obtained during the last eclipse, and it would not surprise me to hear that the spectrum of the bright part of the corona has been photographed. Has it ever been stated why it was desirable to secure a photograph of the spectrum of the corona? Your contributor appears to be interested, and can, perhaps, throw some light on the subject. Most of the spectroscopists who have seen the lines of the coronal spectrum are agreed as to which they are, and I fancy they will know very little more after the lines have been photographed. The chief point of interest during eclipses will always be the forms of the details of the corona. Much has already been done—just so much as to make us desirous to see more—and if observers would give their attention to the attainment of the largest and most perfect pictures, we may possibly, *in time*, learn something of the meaning of those wondrous rays seen only during a total eclipse.

Referring to the writer's remarks as to my pictures of the corona taken in 1870, as being among the best yet done, one of them is only the best in one particular—that is, as showing the greatest extent of the corona. The pictures done for Lord Lindsay by Mr. Davis are superior to any others for their beauty of detail.

I am glad to see that your correspondent agrees with what I have said in another place, that if the full spectrum of the corona is ever to be photographed, a more sensitive film than we at present know of must be looked for.—Yours truly,

A. Brothers.

Talk in the Studio.

Gelatine in the Developer.—In the article on producing Transparencies for the Lantern, by R. Tudor Williams, in our Year-Book just issued, the formula for the gelatine solution to be added to the developer should have been, 60 grains of gelatine and one ounce of acetic acid in 8 ounces of water, instead of 20 ounces, as printed.

The Lambertype Patents.—It will interest many of our readers to learn that the Autotype Company (Messrs. Spencer, Sawyer, and Bird), have purchased the patent in this country of Mons. Lambert. The enterprize and liberality which have distinguished the business management of the company give assurance that the patents have fallen into good hands, and its high status will give assurance to existing licensees of the maintenance of their interests. See a letter from the Autotype Company for fuller details.

Photographers' Benevolent Association.—The second annual meeting of this association will be held in the Co-operative Hall, Castle Street, Oxford Street, on the evening of Monday next. A somewhat extensive programme of musical entertainments is promised, Mr. E. Cocking taking charge of this department, and besides several ladies, a glee party under the direction of Mr. Valentine Blanchard will assist. Amongst the ladies we find the names of Misses Harding and Ward, and Mrs. Cocking; and amongst the gentlemen Mr. Brooks, Mr. C. Pearce, Mr. H. G. Cocking, Mr. Sargent, Mr. Attwood; and also Mr. Frank Haes, who will perform on the zither. A lantern display will also form part of the festivities.

Photographic Festivities.—An extensively attended banquet and ball were held at Liverpool last week on the occasion of Mr. R. Brown resuming sole proprietorship of the business, which has for some time been conducted as Vandyke and Brown. A congratulatory testimonial address from the staff was presented to Mr. Brown on the occasion.

Selling Methylated Spirit without a Licence.—A few days ago, at Wandsworth, an oilman was fined £12 10s. for selling half a pint of methylated spirit without a licence.

Photographs on Board the "Challenger."—A letter from aboard the exploring ship *Challenger* says:—"On the afternoon of August 19th we proceeded out of the bay under steam to the southward for the Society Islands. The most valuable addition to the work of this ship obtained on this island were some excellent photographs of the beds of lava at Kilanea, taken by the photographer. These will be of great interest, as they are the first photographs yet taken of one ot the largest, if not the largest, volcano in the world. This is a great success, considering the difficulties encountered in conveying the apparatus and chemicals such a great distance on a very bad road.

M. Daguerre's Camera.—At a recent meeting of the Philadelphia Photographic Society, Mr. Tilghman called attention to a camera which had recently come into his possession, interesting, from the fact of its bearing the signature of M. Daguerre on one of its panels. It was an old fashioned sliding-body camera fitted with a three-inch achromatic single lens, which, however, appeared to have formed part of a doublet, as there was a screw thread for a similiar lens at the other end of the tube. Mr. Tilghman deposited this relic with the Society.

"Ruined by Chinese Cheap Labour."—At a photographic meeting in San Francisco, a curious complaint of the injurious competition by Chinese cheap labour was brought under the attention of the meeting. A member mentioned that a practice had arisen of sending photographs over to China to be copied, and suggested that Government should be asked to repress the practice, by imposing a higher tariff on their import, so that they could not be sold cheaper than home produced work. The meeting agreed in condemning the practice, but thought that nothing could be legally done to stay the evil.

Charge of Embezzlement.—Thomas Vipond, a well-dressed young man, was charged with embezzling the sum of 2s. 6d., the property of Christopher Rawlinson, photographer; also further sums of 2s. 6d. and 8s., on the 10th and 8th September respectively.—Mr. Holland appeared on behalf of the prisoner.—Mr. Rawlinson, who carries on business in Blackburn, as a photographer, stated that the prisoner was in his employ from March, 1875, to September. His duties were to assist in photographing, and to receive money and to account for it in a book kept for that purpose. He had not accounted for the sums mentioned in the summons. He left on the 17th September, during the night; but witness did not receive any intimation that he was going. On looking over his accounts lately, he had found about £7 received and not accounted for. The morning after the departure of the prisoner he found the following letter:—"Mr. Rawlinson, get your money the best way you can. Don't look for me; it's no use. You will never find me, and you will also never get your guitar. It is pawned. You are clever.—T. V." In cross-examination by Mr. Holland, Mr. Rawlinson said during the time the prisoner was in his employ he paid him 6s. per week, and found him board and lodgings. He had not to take his wages out of the money he received, and it was no part of the arrangement. Sarah Ellen Bradley, weaver, 5, Limbrick, and William Cooper, grocer, Over Darwen, said that they paid the prisoner the money he was charged with embezzling on account for his master.—Sergeant Butterworth spoke to apprehending the prisoner at Nottingham, where he was in business for himself. On being charged he replied, "Yes, that is all." Mr. Holland said according to his instructions the 8s. was paid, and the other sums, amounting to 5s., were kept by the prisoner for the wages due to him.—Prisoner pleaded not guilty, but afterwards withdrew the plea, and was sent to prison for a month.—*Blackburn Standard.*

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To Correspondents.

Re "The Progressive Results of the Past Session," by John Nicol, Ph.D.—Mr. W. E. Bathe writes a clever caustic letter under this heading, which he preludes by the lines from Burns—

> "Hear, land o' cakes and brither Scots,
> Frae Maidenkirk to Johnny Groats',
> If there's a hole in a' your coats,
> I rede ye tent it;
> A chiel's amang you takin' notes,
> An' faith he'll prent it."

And then proceeds to some strictures, pungent and personal, which it could serve no purpose to print beyond causing some irritation and recrimination. The gravamen of his reply is in the following sentence:—"In the matter of albumenizing plates, wherein I have given him amusement, I can only add, 'Laugh, and grow fat.' Where we cannot extract wisdom, let us try to get mirth, and such may be obtained by the spectacle of a learned doctor writing as though there was no force which 'bids defiance to the law Newton thought he had discovered.' Surely some of our Edinburgh friends can enlighten him about a certain species of attraction." Mr. Bathe justifies his reply by saying:—"I can assure Dr. Nicol I have no objection to be held up for ridicule, provided a similar weapon be allowed me. As he has drawn this blade first, it is but fair that I be allowed to cross the steel with him."

One Who Tries.—The position of the stop in a portrait combination is determined entirely by the foci of the front and back lenses of the combination. If the front and back lens be each of equal focus to the other, the position of the stop would be midway between the two. If the back lens have a focus twice as long as the front lens, then the stop will occupy a position two-thirds from the back lens and one-third from the front. Depend upon it, the position of the stop in a lens sent out by a good London maker is intentional, not accidental. We should not recommend you to tamper with a lens. The length of tube, position of the lenses, &c., are all regulated by the optician with a purpose. Increasing the separation of the lenses of a combination will flatten the field and decrease the area of illumination. You cannot with advantage modify the focus of a lens empirically. Read the article on the use of stops in our Year-Book just issued.

A Ten-Year Subscriber.—We do not know whether the lecture in question exists in a written or printed form. The simplest plan of ascertaining would be to write to the author. The address given in our pages would doubtless find him. We have published reports and abstracts of many lectures on photography in back volumes of the News, which you, as an old reader, must be familiar with. The best summary of the origin, history, and progress of photography for your purpose is in the *British Quarterly Review* for October, 1866.

An Amateur.—The defect you describe is a very familiar one, and is due solely to the collodion, which gives a tough, horny, repellant film, which causes the aqueous solution of nitrate of silver to run on the surface in greasy irregular lines, or stand in drops, instead of flowing over it in an even way, the result being, on applying the developer, the formation of stains of metallic silver, sometimes looking like oyster shells, sometimes like slug tracks. The best remedy is age in the collodion. It will steadily improve, and, in a few weeks, probably, the tendency will disappear. In the meantime, there are other remedies—or, rather, palliatives—you may apply. If you have a little of an older sample of collodion giving a powdery film, mix it with the sample in use. This will materially improve matters. Or, failing this, add a few drops of distilled water to each ounce of collodion, and shake well. Or, plunge the plate in the bath before the film has too fully set, keep it moving in and out, and let it remain a full time in the bath. And, finally, let as little time as possible elapse between the plate leaving the bath and development.

Messrs. Sherwell.—Your question is, unfortunately, somewhat indefinite. You ask where explicit directions can be obtained concerning the gelatine process of printing from negatives, more generally known as the Woodbury process. The Woodbury process is a method of printing in gelatinous ink from a metal plate, the plate being obtained from a gelatine relief, and that relief is obtained from a negative, by exposing a film of bichromated gelatine under it to light. The process known as the carbon process, most nearly answers to the first part of your question, where you speak of the gelatine process of printing from a negative. If you know nothing of photography, you will not find it easy to acquire either process from written description. The Woodbury process has been described in various articles in the Photographic News; but there is no work on the subject. The carbon process is also fully described in various articles in our pages; but there is an excellent book of instructions, issued by the Autotype Company, at their office in Rathbone Place.

Anxious A. B. C.—The red prussiate of potash alone is not sensitive to light; it must be mixed with an equal part of citrate of iron, say 2 drachms of each in 2 ounces of water. Paper coated with this solution, and exposed under a negative, are fixed by simple washing, and yield blue prints. Paper treated with bichromate of potash will give impressions of ferns, &c.; carbon tissue will also, of course. There are, indeed, many substances sensitive to light, but we cannot enumerate them or their modes of use in this column. You will find a process described by Dr. Diamond in our Year-Book. The Autotype Company have now become the owners of Mons. Lambert's patents, and his lessons in this country are now under different arrangements. See announcement of the Autotype Company.

Nobody.—The word is "inalterable," meaning permanent. By a printer's error, the first syllable *in* is separated by a space from the remainder of the word; but it can scarcely mislead an attentive reader.

W. C. E. (New Jersey).—We published all the details which were given by the experimentalists, and on reading the article again, our correspondent will see that it is stated that the sulphur was fused. We do not see any probability that the light can be used with advantage for portraiture; or that it would be either cheaper or better than the magnesium light, which possesses the advantage of being ignited and extinguished in a moment, which the light in question could not be. We regret that our engagements do not permit us to write private letters in reply to photographic queries.

Light.—We do not know of any agent for the Holmes' stereoscopes in this country. Possibly Mr. Atkinson, of Manchester may have them. Mr. Meagher has made some; but we do not know whether he keeps any in stock.

T. Pell.—Any platen machine may, we believe, be used in working Albert's photocollographic with printer's ink. It is quite untrammelled by any protection in this country, and any photographer is at liberty to work it.

Cha-meal-ion.—We are obliged by our correspondent's friendly and interesting letter. It is only necessary to mention that of the three inducing motives our correspondent mentions, only one exists, or possesses any weight: the position of an old contributor always claims consideration. The personal and the commercial element do not exist here. We do not complain of the tone in which your grievance is stated. It is not one, however, which often occurs. What a pity the same amount of time and ability was not expended in writing something we could have printed, and which would have been edifying to readers.

R. Maidstone Smith.—Many thanks.

A Little Photo.—Too late for this week. In our next.

Our Year-Book.—We have been favoured with many courteous and complimentary letters, speaking in high terms of our Year-Book, for which we are greatly obliged. Our friends will please accept this general acknowledgment of their pleasant letters.

Several Correspondents in our next.

The Photographic News, January 28, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

How to Obtain Increased Illumination—Photography and the New Mobilization Scheme—Dammann's Race-photographs.

How to Obtain Increased Illumination.—On Friday evening last Dr. Tyndall demonstrated very fully the more important points connected with his recent researches, at the Royal Institution, Albemarle Street. Indeed, he entered more in detail, so far as several branches of his subject were concerned, than he had done the previous week at the Royal Society, and he was enabled, too, to give more complete and striking experiments. Curiously enough, he dwelt upon one point upon which we had ourselves speculated last week in these columns. As you can decrease luminosity by abstracting the mechanical particles floating in the air, so you ought to be able to increase the same by augmenting the amount of floating matter, a circumstance, we said, which might be of considerable importance to photographers. Dr. Tyndall, on Friday night, proved that luminosity was perceptibly increased in this way. He first of all showed his audience a series of flasks simply containing air, which had been left to stand for different periods of time. He allowed an intense beam of light from an electric lamp to shoot across the theatre, and then interposed these flasks, one after another, in the path of the beam. A flask which had but recently been filled with air was luminous inside; but as those which had been kept three, four, five, and six days were interposed, it was seen that the illumination inside the flasks became weaker as the particles were more completely deposited, until there was no ray of light observable at all where the flask cut through the beam. Then an experiment of an inverse character was made. A series of flasks, in which a solution of some sort easily decomposed had been introduced, were passed into the beam of light. Some of these had stood several days, others but a short time, and it was found that those which had remained the longest were by far the most luminous, one flask which had been sealed up for nearly a week presenting a fine globe of dazzling light when put in the path of the electric ray. This increased luminosity, the worthy physicist pointed out, was due simply to the fact that the air in that particular flask contained more particles than usual. It was, indeed, filled with tiny animalculæ, Bacteria, resulting from the decomposed liquid mixing with the air in the flask. The increase of light was caused by the air in the flask swarming with these Bacteria, which were one of the lowest forms of living organisms, and which, as the learned doctor jokingly observed, might be likened to chemists, for they spent most of their time in bringing about the decomposition of bodies, and emitting smells. The spores or germs of the Bacteria are contained in the atmosphere, and when deposited in favourable localities they became developed. These experiments of Dr. Tyndall prove without doubt that it is possible to render any space more luminous by increasing the particles in the atmosphere, and in this way reflecting and scattering the light from the direct rays in all directions. Whether the photographer will ever be able to make use of this method of increasing the light in his studio is a matter which has yet to be determined. He would not desire, probably, to fill his studio with Bacteria and the noisome smells that accompany their development, and therefore would have to resort to some other method of increasing the floating particles in the air. There are, indeed, many things to be considered before we can make practical use of the interesting results which Dr. Tyndall has brought before us.

Photography and the New Mobilization Scheme.—The mobilization scheme for the army is scarcely the subject for discussion in a journal devoted to matters photographic, but nevertheless we find among the details of that scheme a point of interest to most photographers. We are in future to divide our army, like the Prussians, into bodies termed army corps, each of which will number about 36,000 men and 12,000 horses. Such a corps will be itself a complete army, commanded by a general, and provided with everything necessary to make it independent and self-supporting. It has its quota of infantry, artillery, and cavalry, and of engineers and commissariat staff, as well as its own staff of medical officers, &c. There are also apparatus for telegraphic, photographic, and printing purposes attached, and we read that every army corps will be provided with half a telegraph troop, together with two waggons to act as offices for the telegraph clerks, and six waggons to contain the wires, that are to put different generals and bodies of men in communication with one another. Further, one photographic waggon to be under the orders of the staff of Royal Engineers, and accompanied by non-commissioned officers and sappers, capable of working the photographic apparatus therein stored, is to be attached; the waggon is to be capable of employment as a dark-room when necessary, and fitted up with all the essentials of a laboratory, and for carrying on photographic manipulations. The Engineers chosen to accompany the photographic stores will receive instruction at the Chatham School of Photography, which is under the very able direction of Captain Abney, R.E., F.C.S., than whom, as our readers will agree, no better instructor could be found. Not only does Captain Abney teach his military aspirants the manipulations involved in both the wet and the dry processes, but, what is quite as important, he compels them first of all to go through a course of elementary chemistry, which paves the way to a knowledge of photography afterwards. A chemical laboratory now forms part of the great educational establishment at Chatham, and this being likewise under the direction of Captain Abney, that officer is enabled to teach the art and practice of photography much more thoroughly than would be the case where a studio and dark-rooms are the only facilities available. As a rule, the military students undergo a course of six months' instruction, and they are then deemed fit to practise with the camera independently, and ready to be attached to an army corps in the field. The actual duties of a photographer in warfare can scarcely be defined; but so much has been done, as everybody knows, in past wars by means of the camera, that this instrument is now considered indispensable to an army in the field. In Abyssinia, it will be remembered, photography was employed for copying plans, securing pictures for monuments, and taking views of the enemy's strongholds; and in the Franco-German war, the Prussians employed it for aiding in surveys, during the sieges of Strasburg and Paris, while the French employed it for many purposes around Paris, but more particularly for making microscopic films despatches, which were sent into the besieged capital by carrier pigeons. Indeed, after the experience already gained of the aid the camera can give to the soldier, one need scarcely dwell upon its utility under such circumstances.

Dammann's Race-photographs.—Messrs. Trübner and Co. have published a work which displays the value of photography in connection with the science of anthropology. Herr Carl Dammann, of Hamburg, completed some little time since a magnificent work termed the *Anthropologisch-Ethnologisches Album*, which was nothing less than a monster album, consisting of fifty plates, portfolio size, with ten to twenty photographs on each plate, depicting the various races of man. The value of representing different physiognomies by means of photography, as compared with wood cuts, must be at once evident to all, and the album has been pronounced by scientific men to be one of the most important contributions ever made to the science of man. Messrs. Trübner's work is a smaller edition of the Hamburg Album, the price of which was £15; but this newer work contains very nearly two hundred portraits of men and women representing the principal races of the world. The series of portraits are arranged something in the same way as an atlas, namely, according to a geographical plan, starting with Germanic types, and including various races of Indians, Hottentots, Bushmen, &c. One thing has been pointed out in reference to these portraits, which it may be well to note. After a certain age, it appears, the lines and markings, as well as the expression of the face, depend as much as anything else upon the life and pursuits of the individual. Thus the album shows, among other things, that the elderly Chinese broker, and the Japanese gentleman of sixty-four, are in expression curiously alike what Europeans of the same age and occupation might be.

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NOTE ON CARBON PRINTING.

BY A. GREINER, OF AMSTERDAM.

Will you permit me to forward the undermentioned formulæ for collodion and waxing solutions, which are suitable for use in carbon printing. Plates are prepared with a mixture of these, and the printed pigmented tissue is then developed upon them. The collodion consists of,—

Alcohol	200 grammes
Ether	200 ,,
Fine pyroxilin	6 ,,

The waxing compound is made up of,—

Benzole	300 grammes
Gum resin	12 ,,
Castor oil	12 ,,
White wax	3 ,,

Both of these solutions should be allowed to stand twenty-four hours before use.

Of the collodion four parts are taken, and of the waxing solution one part, and these are mixed together and allowed to stand until they are clear.

The plates are first of all rubbed with a little wax dissolved in benzole, a rag being afterwards applied to remove as much of the substance as possible. The collodion and wax mixture is then applied to the plate, and the carbon image developed thereon.

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NOTICE NECESSARY IN DISMISSING ASSISTANTS.

The following case, reported in the *Kent and Sussex Advertiser*, contains some facts which may be interesting and instructive to many of our readers:—

Marian Heath v. *George Glanville.*—This was an action brought to recover £5 for a month's wages, as assistant to the defendant's photography business, in lieu of notice.

The case was supported by Mr. Stone, and defended by Mr. Burton.

Plaintiff, a young lady, said that up to September last, and two years previously, she had been in the employ of the defendant. On the former occasion she left at her own request. Expecting an engagement in Brighton, she consented to go to Mr. Glanville's for two or three weeks. Hearing that the gentleman at Brighton had died, she, after being in the defendant's employ three weeks, entered into an agreement with him, and it was agreed that a month's notice should be given on either side. She asked for a written agreement, but defendant said that was not necessary, as their word was sufficient. She got 25s. a week. In December he discharged her, without any previous notice, and as he refused to give her the month's wages, she told him she would summon him. Miss Wheeler was present, and heard what took place.

By Mr. Burton: Miss Wheeler was not present when the arrangement was made about a month's notice. When she asked defendant for the month's wages, he said he had got her there, as there was no written agreement. She admitted that she had left on two previous occasions without notice, and that defendant had given her a month's notice. After the first week she did ask whether she was wanted for the following week, but not afterwards. Was paid weekly. Defendant called at her house first, and asked her to assist him in his work. He had called her attention to some photographs, and asked her to send them; but the assistant, whose duty it was to post the letters, forgot them. Defendant had received complaints about some photographs, but it was not her fault.

Miss Wheeler, defendant's assistant, said she was present when defendant discharged the plaintiff. Plaintiff asked for a month's salary, and defendant said he had made no agreement, because he could place no dependence upon her, she having left on two previous occasions in a fit of passion. Defendant did also say, "I have got you there; you have no written agreement." In answer to Mr. Stone, she said both were very passionate.

Defendant said the plaintiff was in his service about two years, and left without notice at a moment's warning on two occasions. He wrote to her, asking her to pay for some goods, and afterwards she came to the shop. She said she was very sorry that she had left in such a way—in such a towering passion—and that if she could help him in any way she would be very pleased. He arranged that she was to come back for a week or fortnight at 25s. per week; and at the expiration of the fortnight she asked him if he should require her the following week. He told her he would consider whether he should engage her regularly, and told her he could not entertain the idea of giving a month's notice and receiving her in his permanent service, because she had deliberately walked out of his place when he had required her to do something he wanted done. She renewed the application on several occasions; but he never agreed to give her a month's notice, which she suggested. She was often in the habit of flying into a passion, and when he asked her to do anything without saying, "Miss Heath," she would not do it, and tell him she had a name. On the Friday evening he asked her to make out a bill, but she refused, and threw the pen across the table. He then told her he should not require her services after the following week. On the Monday morning he received a letter, asking for some photographs, and he twice asked her to send them. He went to London that day, and on the Tuesday morning he found that she had not sent them, though she had sent others of no importance. It was her duty to post the parcels, and not the assistant's. He also had a letter that morning, complaining of some photographs being sent home unfinished; and in consequence of the complaint he did feel somewhat annoyed, and told her she did not do her work properly, she was injuring his business, he could place no dependence in her, and he could dispense with her services. He admitted he did tell her she had no written agreement, but that was to stop her tongue, which was rattling away at a great rate. Had told her a week's notice was no good.

His Honour said it was quite clear they were not going on harmoniously, and he was of opinion that the understanding was that there should be a month's notice. There would be a verdict for plaintiff.

Defendant asked whether he could take it to a higher court; but his Honour said he would not grant him a case.

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HIGH POWERS IN MICRO-PHOTOGRAPHY.

BY C. SEILER, M.D.*

Some time ago I exhibited to the Society the camera and apparatus designed by myself for the purpose of making enlarged photographs of microscopic objects, and at the same time explained it, so that it will not be necessary for me to do so again. My object in reading this paper to-night is to bring to your notice some facts which I have noticed in working with this apparatus.

I desired at some time to photograph blood-disks of various animals, and as they were of a very minute size, it required a power of at least five hundred diameters to show them satisfactorily. In order to get this amplification, I extended my camera to its full length of ten feet, while I used an objective of one-fifth of an inch focal distance. But although I used a powerful reflector and a very good condenser, in order to obtain as much light as possible, the image on the ground-glass—or rather, I should say, the piece of plate-glass—flowed with a thin pellicle emulsion, and then dried, appeared very dark and misty, and by no means could I obtained a sharp outline of the disks. Nevertheless I exposed a plate for five minutes, and obtained a negative of which I place a print before you. As you see, it is hardly possible to distinguish the outline, much less to measure it.

In thinking about this thing it occurred to me that this want of definition might be caused by the want of depth of the lens, as the blood-corpuscles are not flat disks, but have a certain thickness and rounded edges, while they are depressed in the centre, thus having the shape of an ordinary water-cracker. A lens of no penetrating power will show, as you can easily understand, no outline if brought to bear upon such a body as the blood-disk, for the real edge or boundary line of vision is considerably below the highest point of the surface, and so either one or the other will be out of focus, and therefore blurred. To remedy this defect in my lens, I saw there was but one thing to be done, and that was to pass the image through an eye-piece, a combination of a biconvex lens and a plano-convex one, separated from each other by a certain distance. I did introduce the eye-piece into my camera and obtained a much flatter field, and much more definition, but so little light at the distance necessary for the desired amplification, that I saw it would take at least ten minutes' exposure on a wet plate to get a negative. Such a length of time, of course, I could not expose, for the light would have failed entirely, owing to the movement of the sun. I noticed, however, that at a short distance from the eye-piece I could obtain a small picture of great brilliancy and sharpness. When I saw this, the idea struck me that I might treat this brilliant small picture like a drawing to be enlarged by the photographic lens, and accordingly introduced a Dallmeyer rectilinear lens 4-4. This, when placed in the proper position, gave me on the ground-glass an image of great sharpness, and almost as much brilliancy as the small aerial picture which it was copying. Thus I obtained negatives in five seconds sufficiently strong to print, and, what is better, of considerable sharpness. Of them I have two prints on the table, one showing bird's blood and the other the blood of the toad.

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* *Philadelphia Photographer.*

As the difference in size of the blood-disks in most mammals, as compared with those of man, is very slight, and as it is of very great importance in legal cases for the expert to decide whether a given specimen is blood of man or of an animal, such as sheep or pig, I have endeavoured to show this difference, so that it can be measured. In order to do this I placed a micrometer into the eye-piece, which, when in the proper position, will give a sharp image on the negative. Then, by placing two kinds of blood close together on a slide of glass, so that they both are in the field at the same time, I am enabled to obtain an image of the disks and the micrometer, which, as you see in this print, shows a decided difference of size of the disks, and facilitates the labour of the expert to instruct a jury in legal cases. The fact that the micrometer and the blood-disks are obtained on the same negative removes the objection, which might be raised, that the difference in diameter of the disks might be the result of a difference in the power used.

The reflector which I had been in the habit of using, in order to condense the light, was silvered on the convex side, as all mirrors are. This, however, proved to be a disadvantage, as according to the angle in which the light fell upon it there resulted two or more foci, one from the silvered surface and the others from the surface of the glass. These different foci lying in different planes interfered with each other so as to make a ghost, which proved a serious obstacle to definition and sharpness. I therefore tried to get a reflector with but one reflecting surface, and succeeded with the following formula for silvering:—

A.—	Arg. nit.	800 grains
	Aqua dist.	4 fluid ounces
B.—	Rochelle salt	540 grains
	Aqua dist.	6 fluid ounces

Add liquor ammonia to silver solution and form a precipitate, which must just be dissolved with more ammonia. Then add a little more silver until a precipitate is formed which will not dissolve by stirring. To this add twice its bulk of the Rochelle salt solution, and dilute with twenty parts of water. Into this immerse the glass, perfectly cleaned, and leave it for several hours. Then take it out, wash it with plenty of water, and dry by setting it edgewise on blotting-paper. When dry, the silver deposit can be polished with cotton and fine rouge, and will give a very good reflector. I am continuing my experiments in this department, and hope to obtain still better results in future than I have hitherto, and if the members of the Society are interested, I will be happy to bring to their notice anything new and interesting that may be developed.

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THE ACTION OF EOSIN ON THE PHOTOGRAPHIC SPECTRUM.

BY CAPT. J. WATERHOUSE, B.S.C.

*Assistant Surveyor-General of India.**

During the course of some experiments with reference to the action of various dyes in influencing the photographic action of the spectrum upon dry collodion plates prepared with bromide of silver, I noticed, in the 'American Journal of Arts and Sciences' for May, 1864, an account of a new red dye, prepared by Caro, of Baden, and named, on account of the tint, Eosin (from ἠώς, the red of the morning dawn). According to Hofmann it is the phthalein of dibromresorcin or tetrabromofluorescin. It is soluble in water or alcohol, the solution being of a bright rosy orange-colour, and showing a strong yellowish green fluorescence, tending to green in the watery solution, and to yellow in the alcoholic. Examined with the spectroscope, a solution of it cuts off part of the green and blue rays from about ½D—E to ½F—G. It stains the skin, paper, &c., of a fine rose-colour.

As I anticipated, from its chemical relations, that this dye would probably be particularly suitable for obtaining results of the same kind as those obtained by Dr. Vogel with other dyes, I procured some from Berlin, and am glad to find that my anticipations have not been altogether disappointed.

On adding a small quantity of the dye to bromized collodion, I found that the fluorescence entirely disappeared, and the collodion took a bright golden yellow tint, inclining to light orange, but without any trace of the rosiness peculiar to the dye. This effect is very similar to that produced by adding acid to a solution of the dye.

Dry plates prepared with this collodion and exposed to the spectrum showed on development a much greater sensibility to the green rays than to the blue, the maximum of action being in a band below E, extending to about halfway to D, and then decreasing till all action ceases just below D. Above E the action slowly decreases nearly to F, beyond which very faint action extends far into the ultra-violet. The increased action in the region of the yellow and green is very strongly marked, particularly by its contrast with the very weak action throughout the blue and violet.

On another dry plate prepared with plain bromized collodion of the same kind, but stained by immersion in a watery solution of the dye, the same general characteristics are to be observed; but the image is stronger, and the band of maximum action somewhat more extended between E and D towards D, at which point the spectrum ends almost abruptly. This plate further shows a marked band of decreased action just above F, and extending about halfway between F and G. It is also noticeable that traces of action in the green and yellow were distinctly visible on the plate before development, though not in the blue and violet. This is the only case in which this effect has been noticed, though I have tried my different dyes giving increased sensibility in the less refrangible part of the spectrum.

Wet collodion plates prepared with the ordinary bromo-iodized collodion stained with eosin (which, unlike the bromized collodion, retains the fluorescence and rosy tint of the dye) exhibit a marked prolongation of the spectrum towards the less refrangible end, reaching a limit about D; but here the character of the spectrum is entirely changed from what it was on the dry bromide plates, and we have an image of fair density showing a band of maximum action extending from a little above H_2 to a little below G, where there is a sudden and distinctly marked band of lessened action extending to about halfway between F and E, from which point the action then decreases to its minimum between *b* and E, and again rising at E, gradually decreases till it disappears about D.

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* Read before the Photographic Society of Great Britain.

From this remarkable sensibility of the green and yellow rays, it might have been anticipated that wet plates prepared with the eosin-stained collodion would show an increased sensitiveness for foliage and other coloured objects of a green or yellow tint. On trying a landscape, I found that though the collodion was by no means strongly stained, the exposure was increased to about three times what was necessary for wet collodion. There was no marked increase of detail in the foliage, but, if anything, a decrease. There was, however a great increase in the density of the image and in the clearness of the shadows. Subsequent trials, both with dry bromide and wet bromo-iodide plates, on bouquets of flowers and a stained glass window comprising red, green, blue, and yellow, showed that but little practical advantage was to be gained by the use of the stained collodion, though the plates were undoubtedly more sensitive to yellow than is ordinarily the case, and showed the same increase of intensity, which may be a further advantage.

I have not yet had leisure to fully investigate the action of the dye; but this brief record of a few results obtained with it may be of interest as bringing to notice a colouring matter which in some degree supports Dr. Vogel's theory, that a film of dry bromide of silver may be rendered sensitive to certain rays of the spectrum by being stained with a colour which absorbs those rays—in this case the green—and also as showing that the photographic action of the spectrum is but a slight index to the action of the coloured objects around us, and that we have yet to look for methods which will enable us to overcome the difficulties of photographing the so-called non-actinic colours, though it is not impossible that success may ultimately be attained by somewhat similar means.

The accompanying four photographs may serve to give an idea of the relative degree of action of the spectrum on the stained plates as compared with an unstained wet collodion plate.

When leisure permits, I hope to carry out further investigations on the photographic properties of this dye; and should other results be obtained, I shall not fail to communicate them.

Calcutta, December 17*th*, 1875.

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RETOUCHING NEGATIVES.

BY W. H. RULOFSON.*

Retouching negatives is a subject of vital importance to photographers, and one upon which a great diversity of opinion obtains. We have enthusiastic admirers of the works of the camera who affect a preference for the photograph pure and simple, free from any embellishment; to them photography is the sum of all good, and every effort to improve it, which involves therein the honours with any other branch of art, is resisted as pernicious, tending, as they claim, to eradicate the features which distinguish photographs from other pictures; and in support of their position they point to the acrimonious controversy which occurred some years since in the city of London. It seems that at an art exhibition a department was set apart for photographs, to which photographers brought their art works, having availed themselves of all the means at their command to produce fine pictures; but they were met at the door of Photographic Hall by the committee, who informed them that "weaving spiders come not here;" these pictures evince too much care in finishing, too much industry, too much enterprise; in short, they show unmistakable evidence of having been tampered with by an artist. "None but photographs admitted here," say they, urging in defence of their zeal the manifest injustice of requiring photographs to compete with these, the result of several arts, the work of many hands. Did these men recognise in this a defeat? On the contrary, they argued that if their productions were too meritorious to entitle them to a place in the lower, they had gained an entrance among the higher walks of art.

We next find them knocking at the door of the inner temple. Here also they are met by a committee on classification, who discover oil, water-colour, India ink, pencil, and photograph combined, saying these pictures belong to no known class; beautiful though they be, they are only photographs, and must be content with a seat below. Thus were they excluded from both the upper and the lower house by committees, whose loyalty to their dictative branches would set up a lion in the path of photographic advancement, and deprive the public of the advantage of the then almost unknown possibilities of our beautiful art. And thus we have ever found it, that the photographer who pushes the retouching of either negative or photograph beyond what has been termed "legitimate photography" meets with opposition from the artist, who asserts that he has been foraging in his domain, and the son of Helios urges that he is poor indeed when compelled to draw so largely on other sources for the perfection of his work.

It will be seen that before we can agree upon the best method of retouching a negative, we must first gain the consent of the stickler for "distinctive photography" that the negative should be retouched at all; and second, if retouched, how far can we carry the process without going beyond the sacred precincts of legitimacy; and in the consideration of this subject let us inquire what is the object held in view in opening a photographic establishment. Is it in order that we shall produce photographs as such? or have we and our families and business necessities like unto other men's, which render success indispensable? An affirmative answer to these questions, coupled with our daily experience with patrons, leaves no room for argument as to the necessity and propriety of retouching negatives. But to settle the point as to how far we may properly carry the process is not so easy. We are constantly told by Mr. A., that with regard to Mr. B., we have made him young; we have made him a flat, baby-faced fellow, taken all the character out of his face, over-retouching it, &c., &c., all of which we know to be true, and, modestly assenting, seek to excuse our fault on the score of necessity. "Well," says Mr. A., "that is all right, but none of that for me; leave all the character in my face; no retouching on my negative; or, if any, only the least little bit—just enough to remove imperfections in the negative." And so passing round the room he hurls his anathema against all your best pictures, repeating his injunction to leave everything in his hands.

All this, coming as it does from a gentleman of wealth, education, and refinement, more than likely a distinguished member of a learned profession, would, in nine cases out of ten, mislead the inexperienced photographer, and lure him on to certain ruin; but the wary practitioner, who at once recognizes the necessities of the case, takes the negative of this Mr. A. to his best rétoucher, points out all the ravages of time, and directs that they be most carefully and thoroughly removed; calls particular attention to the chisellings of thought, and requests that they be most delicately modified, and the youthful perfection of face and form restored to the last degree. He then makes two or three pictures from the negative, thus "over-retouched," for Mr. A.'s inspection. Thus armed he waits his coming, but not long; doubtless he has been in three or four times in the meantime to see "how you are getting along with it," and to call attention to some dozen or two little things he would like to have done which he forgot to mention. "Don't do much retouching, you know. Just a little here, and there, and the other place, you know, but leave all the character in it, all the modulations; these things don't look like anybody." But at last he comes; you hold your breath with apprehension as you see that fearful frown gather upon his stately brow, wondering what will come of it; but you are reassured as his features relax upon your apologetically passing one over the counter, timidly explaining, "It is not quite finished, you know," "only made as an advance proof to look at, you know," "only made as an advance proof, you see, for you to look at, you know." "Yes, yes," says Mr. A, noticing at the same time that you retain one or two more in your hand, "but what did you make so many for till you retouched the negative?" But what did you make so many for till you retouched the negative! And astounding as this expression is, it stops not here, for this same Mr. A. goes on to explain that "this is very good, and if you will just correct this deficiency in hair, take out these ugly shadows from around the mouth and eyes, which I have not," and then adding a long list of similar corrections, "Now just write them down so you won't forget,—it will be quite satisfactory; and he goes away thoroughly convinced that over-retouching is an abomination. And while he complains that every picture in the room is over-retouched, his have not been retouched enough. Every observer of what transpires between the photographer and his customer must discover this one peculiarity: that which is pronounced too much for all other pictures, is entirely insufficient when applied to their own particular case.

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* Condensed from a paper read at the November meeting of the Photographic Art Society of the Pacific.

While I am willing to admit these are notable exceptions, it is nevertheless true that events similar to the foregoing enter more or less into the experience of every photographer; and this is only one class of advocates for excessive retouching. There are thousands who boldly confess that they wish their pictures made beautiful—all the lines, wrinkles, freckles, irregularities, and imperfections, not modified, but removed; for this they are willing to pay any reasonable price, but will accept nothing short of this, leaving us no alternative between "legitimate photography," idleness, and poverty, and skilfully retouching negatives, with liberal patronage and consequent prosperity. I think I am justified in recommending the latter. But the objecter, "having put his hand to the plough," refuses to look back; he returns to the contest with the assertion that when so much reliance is placed upon the skill of the retoucher, the duties of the closet and operating-room are neglected, and inferior negatives the result. This, in many cases, is but too true; but, I claim, that in no case is it necessarily so. I think every conscientious photographer will agree with me, that each negative should be made with as much care as though the art of retouching was unknown. To do less than this would be like unto a machinist who would omit a vital part in the construction of a locomotive because he knew it was to be intrusted to the hands of a skilful engineer.

Having endeavoured to call your attention to the necessity of retouching negatives, and also to show that there is a demand for a great deal of it, I now proceed to a consideration of the best method of accomplishing the work.

So far as my knowledge extends, there are three methods employed in this city, each possessing some advantage over the other, which we can ill afford to dispense with, and each having some objectionable features, which it is the object of this discussion to overcome.

First on the list I will place the oldest and most commonly employed process of retouching on "gum," which admits more free use of the needle in making erasures, by which more extensive alterations may be made in a negative than by any other means known to me, but which also presents the difficulty of so matching the opacity of the negative in the parts surrounding the pencil work, that the subsequent varnishing will not lose the opportunity to print in light spots; and I apprehend that the only remedy will be found in selecting a grade of light and shade, and a delicacy of touch, which aims not at producing a finished negative, but makes due allowance for the inevitable changes produced in the thickness of the film by the subsequent varnishing.

Second, retouching on varnish which has been previously ground with pumice-stone, or other grit, one conspicuous advantage of which is that no subsequent process is necessary which changes the value of the work done; the negative passing to the hands of the printer in the same condition that it leaves the retoucher, the film once being matched by the pencil, it so remains. The importance of this can scarcely be ovestimated, and at first sight seems to be all that could be desired, but we are met at every hand by necessities which this method fails to meet, to wit, removing or reducing light portions of the negative, such as changing the lines of a cheek, the mould of a shoulder, the taper of an arm or finger, &c. A varnished negative offers a most unpromising surface for the use of the needle or other reducing agents, besides involving the risk or almost certainty of the film scaling off around the erasure. The grinding also increases the printing power of the negative in the parts ground, destroying its harmony, which, however, might be partially remedied by acting on the valuable hint thrown out by Mr. Winter at our last meeting, in his remarks on strengthening the shadows in the face by applying gum with a small brush.

Lastly, retouching on "chill" or "grit varnish." This method has much which commends it to my favourable consideration. The negative is left, after varnishing, with "ground glass" surface, favourable for retouching; its printing power is uniformly increased, but, as in the preceding process, a radical change in the negative is difficult, if not impossible. As the traveller at the forks of the road, upon inquiring which was the best, "No matter which you take, you will wish you had taken the other;" so have I ever found it in retouching negatives. The difficulties present themselves in such vast numbers, with constant accumulating force, that we are periodically seeking refuge from pressing ills by adopting the previously discarded methods, vainly hoping to effect a transfer of advantage of one process and an evasion of the obstacles of both.

NOTE ON GLAZING STUDIOS.

BY FRITZ LUCKARDT.*

The inconvenience resulting from the dropping of moisture from the glass roofs of studios, especially in winter time, after severe changes of the temperature, is one well known to photographers. Generally the means taken to prevent this disagreeable occurrence is to re-putty the junctions, and to paint them with oil, or red lead, an operation which, according to my experience, only aggravates the evil.

By adopting a plan of glazing which I follow, the defect I allude to falls away altogether. Instead of having the panes of glass cut in right angles, as shown in fig. 1, I adopt another shape, the rhomboid, fig. 2, and have the plates all fashioned to this outline. The consequence is that the water, or moisture drops, which previously collected upon the horizontal edge, and then fell into the studio, always run off at *b*, in fig. 2.

FIG. 1.

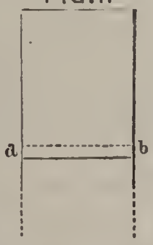


FIG. 2.

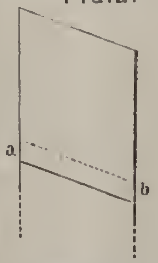
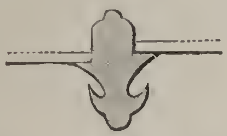


FIG. 3.



In building new studios, it is well, too, to fix a double rim to the iron rods to act as a gutter; and, if possible, the glass plates, as in fig. 3, should be a little higher on one side than on the other, to facilitate the escape of the moisture.

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* *Photographische Correspondenz*

The Photographic News.

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WORKING THE AUTOTYPE COMPANY'S PATENTS.

A correspondent on another page raises a question which has been put to us by some other readers relative to the terms upon which carbon printing can be worked in this country. Our correspondent, "Argus," appeals to us as expositor and champion of carbon printing, and advocate of the patents under which the possible processes are worked, to explain the precise meaning of a letter from the Autotype Company, which appeared in our last, and to reconcile it with the statements in the Company's advertisement in the same number. One or two remarks on our real position in relation to the subject, as distinguished from that he had assigned us, may be necessary at the outset. That we have been one of the earliest advocates of, and staunchest believers in, the universal adoption of carbon printing, we readily admit. It has been our good fortune to make the first announcement of each important step in its progress. We have maintained the legitimacy of patent claims of distinct invention and unquestionable novelty, and we have maintained also that the existence of patents in relation to a process requiring the investment of capital, both in time and money, to bring it to perfection, was an absolute gain to the community. Beyond this we have no relation to the processes or patents in any way. We know nothing of the commercial aims and intentions, beyond what the patentees announce. We are neither expositor of their intentions, or advocates of their rights, except so far as these may harmonize with the interests of photographers, and the advancement of the art. And so far as we have been able to note their intentions through all the phases of the Company's history until now, a wise liberality has distinguished all their operations, in which the interests of the photographic community at large, and the advancement of the art, have been better secured than it would have been, had none of these patents existed.

From reading the advertisement and letter in our last, in relation to the future relations of the public with the patented processes, we should not have thought the announcements to be fraught with the ambiguity of which our correspondent complains. Without any authoritative right to act as expositor, we should have said that so far as the patents which have belonged to the Autotype Com- for a few years—and which they have permitted the public to work on conditions of purchasing the patented material of the Company—are concerned, the relations are not changed. As stated in their announcement in our last, the Company accorded to all persons the right to work these patents on the conditions clearly stated. But in relation to the new patents which it has just bought from M. Lambert, and for the use of which a large number of photographers have paid M. Lambert, the Company will also make a change, and, in doing so, will grant licences which will comprehend all the processes under all their patents.

Since commencing this article, however, a new announcement has been placed in our hands, making entirely new arrangements, placing the use of the patents on a business footing, but on terms of such extreme moderation that it scarcely can become a consideration to any one, whilst it makes the position more satisfactory by establishing a well defined commercial relation. It seems that amateurs will receive a licence on mere payment of the registration fee of five shillings; whilst professional photographers who use the process for profit, will receive a licence on payment of one guinea a year during the operation of the patent. The arrangement as to tuition is also put upon a more satisfactory basis, as will be seen from the announcement in our present issue. Instead of giving gratuitous lessons, the Company will now take the wiser course of making a charge for practical instructions in the processes. In relation to the Lambert patents, the arrangement is, of course, different, as may be ascertained from the business announcement in our present issue. It is, we think, more than probable that all who intend to go into carbon printing on the commercial scale, which must come, and that ere long, will be anxious to possess the latest and best facilities for the work, and will secure licences for the improvements which, confessedly, materially facilitate the work, and give higher quality to the results.

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RECORDING VARIATIONS IN ACTINISM.—A NEW SYSTEM OF LIGHTING.

It was a favourite notion with the late O. G. Rejlander that some valuable knowledge might be deduced from the systematic record of the varying conditions of actinism, as observed in photographic studios in various parts of the kingdom; and he at one time proposed a project in our columns, to the effect that photographers in various parts of the kingdom should systematically observe the apparent and actinic value of the light during different hours of the day, and at stated intervals (say once a month) send to us for publication a summary or abstract of the recorded results. Various possible advantages, he conceived, might be derived from a perfect knowledge of the conditions of variation, into which we need not now enter, as the project was never carried out.

During the final months of last year Mr. Winstanley gave in our columns an interesting diagramatic record of the varying actinic conditions in Blackpool, and we have a communication from Mr. Slingsby, of Lincoln, a careful observer, and, as every one knows, a most capable photographer, pointing out the curious coincidence between his own observations with the camera, and those of Mr. Winstanley, the studio conditions at Lincoln, of which he had been keeping careful record, being strictly in accordance with those observed and recorded by Mr. Winstanley at Blackpool.

The special aim of Mr. Slingsby's observations was to estimate and compare with other standards a new system of lighting which he had recently worked out, and which promises, so far as we can learn, results of extraordinary rapidity. Of the principle involved we cannot speak at present, but hope shortly to be able to give details. The rapidity of working described seems to be almost incredible. In the month of December last, an exceptionally dark month even for winter, Mr. Slingsby was securing children's portraits in from two to three seconds. We have a record of the time given to each of a dozen negatives on the 29th of December, a duller day than many others in that month. At mid-day, two card negatives were produced with a No. 2B lens; no aperture is mentioned, but doubtless the largest stop which would give definition would be used. Even then the exposure was marvellously short: one negative was exposed seven seconds, and one five seconds, and six would have been better than either. At half-past three on the same day, a negative, with two and a-quarter inch head, was obtained with a No. 4A, with forty seconds' exposure

The records we have before us beyond a question indicate an unusual rapidity of exposure, and we shall hope ere long to give full particulars regarding the mode of lighting upon which the rapidity is said to be based.

ON A METHOD OF ENLARGING PHOTOGRAPHS.

Specially Adapted for the Use of Artists.

BY A. E. CADDY.

Take a thin sharp negative when photographing with a view to enlarging from it. A bath containing nitrate of baryta gives most perfect negatives for this purpose. Any negative, however, will do, from which it is possible to make an enlarged positive on paper.

As there are several methods of making enlarged positives on plain paper, I will only point out the requirements needed for our present purpose: moderate density *by transmitted light*, freedom from stains, and general cleanliness. The development must not be pushed, and the hyposulphite of soda used in fixing must be clean, and thoroughly removed after it has done its work. Strain this enlargement before it is quite dry on a glass plate, and with a finely pointed crayon (Woolfe's BB crayon in cedar is a very good pencil) put in the very deepest shadows and sharp touches; generally broader passages may be worked in with a stump, but the crayon powder used must be absolutely free from grit. Plumbago may be used with advantage in place of crayon powder. It will suggest itself here to touch in such accidental defects in the picture as may be brought up to the surrounding tint. The paint brush with sepia, or fine Indian ink, may be used in place of pencil and crayon when one is a facile worker in water-colours. Objects not in the picture may be here introduced; the shadow portions only, as the lights must all be left till later. How to introduce an impression from other negatives in combination will be mentioned later on. I here wish to confine myself to the simple process. We will call this the first portion of the operation, which closes as soon as the artist has done all he wants to the *shadows* of the picture. To strengthen the shadows gradually (or abruptly), a broad chamois leather dabber may be used, dipping the same into plumbago powder, which, of course, must be dusted off so as to allow an even tint; or this may be done in the second operation.

§ 2. For the second operation it is necessary to have a special printing frame, which I proceed to describe:—

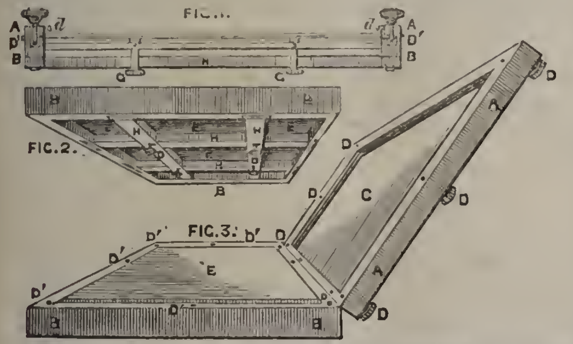

Fig. 1. Section lengthened. Fig. 2. View endwise, showing B from the back. Fig. 3. View endwise, showing the frame open. The plate E has been pressed up through B in turning the screws G G.

A. Upper portion of frame hinged to
B. Lower portion.
C. Printing mask (negative or positive).
D. Screws fixed in upper portion of frame.
D'. Female screw for D.
E. Plate glass, on which the paper to be printed on is strained.
F. Panel lined on the back with a single thickness of broadcloth, the surface being a true plane.
G. Mill head screws for pressing E and C into contact.

E and F must be able to move within the frame B in the direction of the pressure of the screw G, and *not in their own plane*.

H. Cross-bar at the back for the screw G.

The screw G being turned, the plate E is pressed up into immediate contact with C, the opening in the frame being true to the opening in B, through which the plate E moves.

C is a thin *patent* plate, and the instrument is so constructed as to relieve this patent plate C of any unnecessary strain. The plate should be as thin as may be consistent with its size and weight. A thick glass would be useless. A small rebate at the corner of the upper frame can be put in by means of a screw when the negative plate is inserted to hold it in its place; this plate must obviously be larger than the carrier of the sensitive paper.

Slightly damp your worked-up positive. This had best be done by wringing the water from a large wet towel, and spreading it out on a table, the picture being laid on its back on the towel. In two or three minutes it will be quite limp enough; on no account must it be wet. Now take your patent plate and paste on the back slips of paper an inch wide, leaving enough to turn over as will come within the rebate of the frame. Take the damp picture and lay it on the opposite side of the plate, face outside. Double the slips over, and paste them on to the picture, which must now be dried equally. This must now be put into the frame, where it becomes C. Before a sheet of sensitized albumen paper becomes dry, strain it in the same way on E. When dry, close the press, turn DDDD home, and bring the printing surfaces into contact by turning the screws GGGG. Your albumenized paper must be a bright sample of Steinbach's; it must be as thin as convenient. A strong nitrate bath is necessary. Two negative prints must thus be made. They are to be *slightly* toned and fixed, after which a rapid washing will rid them of the hypo. The strength of the paper must be husbanded during the washing. This closes the second operation.

§ 3. Take the better of the two prints thus made, and lay it on its face in a retouching frame, having first strained it on plate glass. One mounted after the fashion of a drawing-board would be very convenient.

In touching this picture I would recommend the artist to limit his material to a superior sample of blacklead pencil, say Cohen's or Faber's BB or BBB. All the sharp high lights are first put in; I should say with a tolerably sharp point; the eyes are made clear and free from the glary defects most often found in photographs. All the defects in the picture which would print dark are touched up, and remember you are working up lights now. A stamp and dabber will work in larger effects. For delicate light passages it will be better to rub the lead of a pencil on a slab and to take the powder off the slab with an appropriate stump. Bring up the lights of any accessories whose shadows already exist, and work up generally for detail where it is wanted, keeping your touches crisp. Anything out of focus very badly should be made distinct. For general effect of light take the other picture, or rather negative print, and put in the lights of larger passages. A cheek, for instance, which is too dark in the picture may be brightened up a bit by cross hatching with a rather blunted pencil. All defects in this print must also be touched out.

These negatives may be rendered transparent, in which case the printing will have to be very deep indeed, on fumed paper, and the touching up must be done after the papers have been made transparent. This method will be preferred where it is an important matter to print very quickly. Moisten four slips of paper for the four sides of the patent plate, and double them down. One negative is now attached to either side of the patent plate No. 1, with its face outside; No. 2 behind it, with its face to the glass. This must be done by means of the moistened paper and paste. As these slips of paper dry, they will strain the negative across the glass, which completes the third operation.

§ 4. A sheet of thick double albumenized paper is now strained over the plate glass E, and a picture is printed in contact with the negative. It may, of course, be examined, and there is no danger from cockling when the paper is dry. If the paper negatives are transparent, it will be advisable, when printing in the sun, to have the frame at right angles with the sun's ray. When the print has attained the depth required for the finished picture, a turn of the screws at D breaks the contact between the negative and positive, and the printing is finished in this position. Where transparent negatives are used, it is absolutely necessary that this printing be done at direct right-angles to the ray of light.

§ 5. When there is occasion to print portions from each of two or more negatives, it will be necessary to make an enlarged positive from each negative. All but the printing portion of each positive must be entirely blocked out with non-actinic colour. When one portion has to be vignetted into another, a system of masks must be employed. Where the accessories introduced from the second negative are better subdued, they need only occur in the printing negative next the albumenized paper. Carbon tissue may be substituted for the final albumenized paper.

§ 6. I have preferred giving a detailed description of my process, as I have known many failures occur from too much brevity in working directions given with many processes. The patent plate recommended is an expensive article; but as the negative is merely an envelope, it can be removed at will, and the same glass used over and over again. It will therefore seem to economize the use of glass. An artist will have all the fidelity of a camera drawing in his picture, while the expression and effect—the art, in fact—will be his own. Manipulative difficulties are reduced to a minimum: where the camera ends he begins.

I have used the word artist several times. Photography and art are as distinct as is the work of a clerk from that of an author. An artist may do, as he has done, wonderful things with photography; my object is to point out one way in which photography may wait upon him. By an artist, I mean a man with a cultivated mind and a well-balanced taste for art, whose eye seeks pictures in everything it rests on; a thing of beauty is never lost to him; and he is able to communicate something of this art-sense to everything he touches.

CARBON NEGATIVES.

BY D. K. GRIFFITH.

Possibly some of your readers will exclaim, "A novelty! a decided novelty!" but this is really nothing of the sort, unless, indeed, fetching up the very oldest formula I could find, and producing a wonderful contradiction, an ancient novelty, may be phrased as such.

I am aided here by old Dame Nature, who has preceded me in forming, by the aid of her miraculous handicraft, those unique productions bound up in the world's history, and which exist so abundantly in its carboniferous strata, that, by cutting and polishing, form beautiful negatives for portraying those hidden beauties of her infant days.

Following humbly in her footsteps, I have adapted carbon

> "To wake the soul by tender strokes of art."

And it will not need an apology from me to offer a few practical remarks upon the all engrossing subject of carbon working, feeling assured that the readers of the News take as much interest in this fast growing art industry as it deserves from the hands of the professional photographer.

Since my first efforts in carbon printing, just one year ago, I have been making many efforts to produce, by independent means, work equal to what I know can be got by the Autotype tissue, so that should occasion happen to leave me depending upon my own resources in any field of fresh labour, I might have this experience to fall back upon. By this means I have tried the reproduction of negatives, and feel so satisfied with the results that I will here point out a means of doing so by the Autotype Company's tissue, as my own form of working is only a *dernier ressort*, and it would be neither just to the Company, nor, indeed, profitable to the manipulator, to publish it here.

Failing to satisfy myself by my efforts to produce in carbon prints results equal to the softness of those by our old friend silver, and unable to soften down the harsh lines and heavy appearance characteristic of carbon productions, I have taken advantage of this feature of hardness in outline and general drawing to use the tissue throughout for the production of *carbon negatives*, which I make in the following manner:—

First prepare a white enamel plate by cleaning and rubbing slightly with a mixture of white wax in ether, coat with normal collodion, and proceed in the way given by Mr. Sawyer in the Year-Book, securing the edges with india-rubber solution.

Next make your safe edge (which that writer has overlooked explaining) round the margin of the clichés with

Coal naphtha	1 quart
British asphaltum	*quant. suff.*

and having procured a transparency from it, proceed, as in the old style with dry plates, to print the transparency by contact with a second piece of carbon tissue, and finish off in the usual way. Let it dry; then place it upon a levelling stand, and having ready a solution of hot gelatine, pour it upon the image, first having made an edging to stay the flow (it must be at least one-eighth of an inch in thickness); then leave it to dry gradually, and when it is perfectly so you can strip it from the glass support, and you have a carbon negative which may be printed from either side; and if the manipulation has been conducted with judgment the prints will be found equal to those from the original cliché.

Much improvement may be made in it by a judicious use of colour gelatine, also applied, while hot, with a fine camel's hair brush. You will observe that the operator has complete control of his work, and a little skill will enable him to secure very fine results, with trifling labour, and only a short sacrifice of time.

Or for the retouching, you may use normal collodion, tinted with aniline dye, as described some time back in the pages of the Photographic News. The negatives produced by this means will at once suggest themselves to the practised manipulator as essentially useful for combinaton printing, and as a ready mode of mechanically aiding him to imitate effects in art where his eye and taste are educated beyond his ability with the brush and pencil.

A WARNING TO PHOTOGRAPHERS.

BY DR. VOGEL.[*]

Photographers are not great supporters of photographic literature. Out of twelve thousand independent photographers in Germany and Austria, there are scarcely four thousand who receive or peruse a photographic journal. I say receive, because the question of reading is another matter. I could, if I liked, mention many a well-known name in whose house I have constantly seen a copy of a journal, but with its leaves uncut. If the photographer in the capital may be excused from the perusal of such a periodical on the ground that novelties reach him through the medium of the Society to which he belongs, one would think, at any rate, that a photographer in the provinces would be glad enough to get a journal of the kind. Nevertheless, one finds a state of general indifference upon the subject of what is going on around; indeed, many readers have complained to me that the subscription for the journal was too high, and have told me frankly that the paper was not worth the money.

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[*] *Photographische Notizen.*

The most astonishing part of the matter, however, is this. The same people who find ten marks (shillings) too much to pay for a journal, are ready to give the first secret process-monger fifty marks, or even one hundred, for a formula which, in their "costly journal," they might have read for nothing.

One would have thought that the business of selling secret processes would have become a thing of the past by this time, after the many exposés which have taken place; but this is by no means the case, for only the other day I saw an announcement from a Frenchman of business, who engaged to teach the art of pigment printing for four hundred marks, as it is described in "Vogel's Manual," &c.; and I hear that already a great many photographers have been found ready to part with this sum.

Four hundred marks are, therefore, willingly given to an obscure traveller, while ten marks are grudged for a journal or a manual written by a well-known man, whose name is a guarantee for the article purchased.

I can tell of several other experiences of the same kind, and intend to do so as a warning to photographers, although there are many, I know, who will take little heed of my words. In the spring of last year, just before my departure for India, an old gentleman, of very respectable exterior, called upon me and represented himself as a photographer from a well-known watering-place, bringing with him a letter of introduction from the sculptor Drake, who, as I was aware, often passed the summer at that particular spa. The letter told me that the bearer had discovered a perfectly new and interesting process, by means of which negative retouching had been superseded, and a great degree of softness in the prints had been secured. I at once guessed that it was a method similar to the well-known Denier process, and asked the photographer whether he had any specimens with him. He promised to bring me some the next day, and then proceeded to button-hole me for an hour over the wonderfully wide application of his discovery, which opened up quite a new era in photography. Then he proceeded to talk of his landscapes, which had caused surprise among all English photographers. Lord Beefsteak had told him that such landscapes as his were not produced in England, &c. I had till then listened quietly to my new arrival; but when he began to praise up his landscape pictures, and to set them above English productions of the kind, I told him that the photographic landscapes of England were in the *very first* rank, and if his works were superior to these, then his pictures must be veritable masterpieces, which I should only be too anxious to have a look at.

On the following day the old gentleman came again, and began to unpack. He brought out a film landscape picture of cabinet shape, such as would scarcely have earned an honourable mention at the Vienna Exhibition, and then some carte-de-visite pictures, after the Denier style, but woefully executed. I at once informed the man that the pictures he showed me were not new, and placed before him a copy of my journal published two years before, which contained, by way of illustration, a Denier portrait. He looked at it in a dazed manner, and then remarked that he thought his pictures were in advance. I therefore concluded it was high time to give him a piece of my mind, and I told him that in my opinion, instead of being in advance, he was fifty years behind Denier. He then acknowledged to me that he had never heard of, nor seen, the Denier pictures, for his means were too limited for him to subscribe to a journal. He had set his hopes upon obtaining a fortune from his invention, as well as the title of Court Photographer; and he begged me, with tears in his eyes, at any rate not to stand in his way, if I could not help him in the matter.

I willingly promised to say nothing on the subject, and gave him, moreover, a few numbers of my journal, in which the Denier pictures are discussed. When I came back from my Indian journey, I accidentally met a gentleman from the same spa, who assured me, to my surprise, that my recent acquaintance was in possession of a secret for which fourteen thousand dollars had already been offered to him, and that he had acquired the object of his ambition, the title of Court Photographer. Afterwards I learnt, in Berlin, that the man had sold to many of the photographers there the process for a sum varying from ten to twenty-five dollars.

"There are always flats to be found in the world," is an old saying with many, and those who speculate upon the weaker of our race always do a better business, therefore, than those who desire to have intelligent people for their customers; but it was somewhat surprising to me to find among the purchasers of this photographer's process a really wide-awake operator, who had himself produced far better Denier pictures than those which were shown me in the first place by the provincial photographer. "What on earth possessed you to swallow the bait," I asked him, "after you had seen the man's productions?"

"Oh! I saw that his pictures were no good," returned my friend; "but I thought that he might, perhaps, be acquainted with a dodge of some sort which would answer better in my hands than in his."

Very probably the old gentleman, seeing that there is little for him to do at home at the watering place where he lives in the winter time, has gone farther afield this year, in order to beat up purchasers for his process, and no doubt his title of Court Photographer will help him a bit, although such a designation is not so difficult to obtain, after all. His highly respectable appearance and his tears will go a good way with many people, and I frankly confess he rather took me in with them.

For this reason I feel little hesitation in forestalling him among photographers. I only hope that what I have said may not have been spoken in vain.

Correspondence.

THE CARBON PATENTS.

Sir,—There seems to be some ambiguity about the letter of the Autotype Company which appeared in your columns last week, and the advertisement which appeared in the same number. The latter announces the free use of the process patented by Swan, Johnson, and Window, on the condition of purchasing the materials of the Company—continuing, in short, the liberal course hitherto adopted by the patentees, and only making a charge for the use of M. Lambert's patents, which they have just acquired—continuing, in fact, in this case also, the course adopted by the patentees. In the letter in your columns, whilst nothing is said distinctly contradicting the statements in the advertisement, there is a certain ambiguity which suggests a possible opposite meaning. It is said in one paragraph that the Company propose to issue, to all who apply, a formal licence to work all the processes of double transfer under their original patents. The letter further proceeds to state that whilst the best method of producing good work suitable for the profession generally was not fairly settled, but in an experimental stage, they were content to allow the free use of their patents to all who chose to work under very simple conditions; but that now they think it is time to get remuneration by granting licences. I do not quote the words at full length, but give what appears to me to be the meaning.

Will you allow me then, sir, to ask one or two questions, and make one or two remarks. I ask the questions of you, especially, whom photographers have acquired the habit of regarding as the expositor and champion of carbon printing, and (you will pardon me for suggesting it) the advocate of the patent rights acquired for its protection and prosecution.

First. Am I right in supposing (as the letter seems to hint) that it is the intention of the Company to withdraw the permission it has hitherto accorded to photographers to work their first patents on condition of purchasing materials of the Company?

Second. The working of a patent having once been given to the public, can a patentee withdraw that right?

Third. Would it not be most unfair and impolitic, even if it were not illegal, to permit photographers to work a process, and acquire a connection for a certain class of work, and then, when they had spent time and money in making it useful and necessary, to pounce upon them with a demand for payment?

I am not attempting to deny the rights of a patentee to a just remuneration for the time and money invested in his patented invention; I am merely protesting in a mild manner against the mode in which, in this case—if my reading of the letter is correct—the remuneration is sought to be obtained. And I would add that, in my opinion, no more sure mode could be adopted of tempting photographers on the one hand to evade the patents, and on the other to retard the progress of carbon printing, which, at this moment, looks most promising. If my fears are erroneous I shall be glad, and glad if you can assure me that they are so.—Yours truly, **Argus.**

[See a few words on the subject in our leader columns, and a further advertisement.—Ed.]

THE RELATIVE COST OF CARBON AND SILVER PRINTING.

Sir,—I presume that carbon photographs will very shortly have the supremacy over silver ones, and possibly take their place; and one thought occurs to my mind in regard to the price. The photographers all seem dumb at present on this subject. But do you think that carbon prints will be executed at the same rate as the silver ones? In my establishment a printer, with the aid of a boy, prints daily from one hundred to two hundred prints; tones, fixes, and washes the next day; they are mounted, spotted, and burnished, while the same number are again printed, &c. Now, in regard to carbon work, it would be simply impossible to do the same amount of work with the same number of hands, consequently more expense will be entailed upon the photographer.—I am, sir, yours truly,

J. C.

CLEANING VARNISHED NEGATIVES.

Dear Sir.—The following dodge for cleaning varnished plates was told me the other day by my friend Mr. Wallis (who, I believe, sent you a description, as follows, some time ago; but which you evidently thought too simple for publication):—

Put your varnished glasses into a dish, and pour over them hot water (nearly boiling), and in a few minutes all the films will leave, or be easily detached from, the plates. I remain, yours truly, **Frank M. Sutcliffe.**

[We can verify the excellence of the method, having tried it. There is some mistake in relation to Mr. Wallis's communication. We do not remember it, and do not think we can have received it, as we always publish practical hints received, whether their importance seems small or great.—Ed.]

A SIMPLIFIED ENAMEL PROCESS BY N. K. CHERRILL.

Dear Sir.—At page 54 of your very interesting "Year-Book" the above is given. I have tried it, and should be much indebted if any of your correspondents, or Mr. Cherrill himself, will let me know how it is possible to keep the collodion film on the glass "after plunging it into water"? I found the film (Mawson's Collodion for Enamelling) left the glass and floated away "beautifully," if I may be allowed the expression. I fancy there must be an error in the formula.—Yours truly, **An Amateur.**

QUACKERY, V. THE STATUS OF PHOTOGRAPHY.

"If the cap fits, wear it."—*Old Saw.*

Dear Sir.—I have read twice through the letter of your correspondent, "One in a comparatively good position," and must say I cannot exactly see what he is driving at; but I beg to assure him that I never had any idea of seeming to be a modest man when I am in the right, and have a very good opinion of myself in general, so he need not, if it suits his purpose (having no defence) spare the plaintiff's advocate so far as his conscience and the Editor will allow him.

The whole question lies in a nutshell. I contend that quack advertisements lower the profession in the public view, morally, socially, and (indirectly) commercially. If "O. I. A. C. G. P." contends otherwise, I will meet him or any other on that ground, not going into extraneous matters. Against legitimate advertising I say no word, being a great believer in printer's ink properly used.

As I have proved aforetime, I am not thin-skinned; personal sarcasm or abuse will not drive me from my point, or make my opponent's case any better. So now, "O. I. A. C. G. P." and others who believe in the quacks of the photographic profession, take up your weapons.—Yours, &c.

A Little Photo.

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Proceedings of Societies.

West Riding of Yorkshire Photographic Society.

An ordinary meeting of the above Society was held on the evening of the 1st November, at the Victoria Hotel, Bradford, J. W. **Gough**, president, in the chair.

The minutes of the previous meeting having been read and confirmed,

The **Secretary** read a communication, and laid on the table a chart, forwarded by Mr. D. Wiustanley, showing the daily variations in the aggregate quantity of light radiated from the Southern sky.

The Society's thanks were voted to Mr. Winstanley for his kindness in forwarding the chart.

Mr. **Gott** was then elected a member of the Society.

The usual thanks having been given by the members to the officers and councillors who had acted for the past session, the meeting then proceeded to the election of officers for the ensuing term, with the following result:—

President—J. W. Gough. *Vice-President*—Jno. Smith.
Treasurer—A. G. Rogerson. *Auditor*—W. G. Thompson.
Councillors—Messrs. A. Sachs, E. Greaves, T. Bnrrow, W. Smith, J. Howarth, E Wormald, A. W. Beer, W. E. Batho.
Secretaries—Messrs. Crosthwaite and Holgate.

Some notices of proposed alterations in the rules having been given, the meeting adjourned.

The Society held its first annual meeting on Wednesday evening, the 17th November, at the Victoria Hotel, Bradford.

Tea was laid at five o'clock.

After tea the company adjourned to the usual meeting rooms, which had been hung round with a large number of beautiful photographic productions. Col. Stuart Wortley had kindly forwarded for exhibition a large number of instantaneous photographs of clouds and seascapes, printed in permanent chromotype, by M. Lambert's process; Mr. Henderson contributed two fine cases of enamels, and a number of excellent landscape studies by Mr. Crawshay adorned one side of the room; Mr. Sachs exhibited a collection of children's portraits; Mr. Greaves, a case in imperials; Messrs. Appleton and Co., a large carbon transparency of full-length figure of lady, intended for the decoration of a staircase window; Mr. Jennings, of Norwich, a number of eburneum prints; and many other objects of photographic interest were to be seen.

A pianist had been engaged, and during the evening a number of songs were tastefully rendered by some of the ladies present and several of the members; whilst others contributed readings and recitations of a delightfully humorous character.

Mr. Howarth gave a sciopticon exhibition of about half-an-hour's duration, with descriptive lecture by Mr. T. Burrow, during which time the company were in imagination taken to various well-known scenes. Some American views of snow and ice-bound rivers and cataracts were very highly appreciated.

A most agreeable and friendly feeling prevailed during the whole of the meeting, and the hour of parting came only too soon, the company breaking up with mutual regrets, and wishing the Society renewed prosperity.

Another ordinary meeting was held on the evening of the 6th December, at the usual place, Mr. Gough presiding.

The minutes of the last meeting having received confirmation,

The Secretary read the Annual Report, as follows:—

"In presenting this, the first annual report, your council feel that they have cause to congratulate the Society upon the prosperous and successful commencement of its career. At the first meeting the names of seven members were enrolled; and in twelve months the number has reached over seventy. No society could have been more unanimous in its endeavours to communicate information amongst its members, nor could a more friendly and genial feeling have existed between them. At the same time, the council would endeavour to impress upon each member the necessity for renewed exertion. Successful as the past year has been, the next should be more so. Though much has been accomplished, still more remains to be done; therefore, let each member individually try to contribute something to the general advancement of the art. During the year death has removed one of our members, Mr. G. Wade. Papers have been read as follows:—'On Warming Studios,' by J. Howarth; 'On the Acceleration of Exposures,' by W. H. Brunton; 'The Woodbury Process,' by W. E. Batho; 'The Lambertype Process,' by W. E. Batho. The Carbon Process has been practically demonstrated by Mr. E. Greaves. A Lantern Exhibition has been given, and Mons. Lambert kindly attended at the October meeting, to show his specimens and explain the utility of his method of working. Out-door meetings have been held at Bolton Abbey, Hebden Bridge, and Rookstall Abbey."

The financial statement was then presented, which, along with the report, was adopted.

The Secretary then read a communication from the Secretary of the Photographers' Benevolent Association, which was intended to be read at the annual meeting, but had arrived too late for presentation; and it was resolved—"That a box be placed on the table at each meeting for the receipt of voluntary subscriptions in aid of the funds of the Association." Mr. Smith, the vice-president, kindly volunteered to supply the box.

Mr. Howarth exhibited several landscape negatives, recently taken by the process published by Mr. Carey Lea, in 1870, which were considered by many members as equal in quality to any they had seen by more recent formulæ.

The President then stated that, owing to business engagements, he would very shortly have to leave England for India for a few years, and, therefore, had to tender his resignation as president of the Society. He regretted extremely the parting with the Society, as he had formed some most agreeable acquaintanceships, and would have to leave many friends to whom he felt closely allied. He would, however, still keep up a correspondence with them, and the absent in body would still be with them in heart.

Mr. Smith then moved that the heartfelt thanks of the Society be presented to the president for the invaluable services rendered by him to the Association, of which he was the founder. He (Mr. Smith) felt a deep interest in his welfare, and sincerely hoped that the undertaking in which he was embarked might prove successful. Four years was a long time to be absent from the Society, and many changes might take place during that time; but he trusted that Mr. Gough would safely return, and again resume his seat amongst the West Riding Society.

The motion was seconded by Mr. Howarth, and unanimously carried.

The President having replied, the meeting then adjourned, and resolved itself into a committee (Mr. Smith presiding), to consider some means of intimating to the president the esteem in which he was held by the members.

A special meeting was held at the Victoria Hotel, Bradford, on the 20th December, for the purpose of presenting the retiring president with a slight acknowledgment of the numerous services for which the Society was indebted to him.

Mr. J. Howarth, having been voted to the chair, rose to explain the circumstances that led to the meeting, by saying that the members in committee had felt that they should not let the president retire from office without presenting him with some recognition of his official competency. As the time had been so limited, it was decided that an album should be bought, in which the members might place their portraits, as an interesting *souvenir* of those connected with the Society. A considerable sum was subscribed, and amongst those members to whom application had been made, were Messrs. Harvey Reynolds and Co., of Leeds, who, through Mr. Scorah, their manager, most generously presented a magnificent and valuable album for the purpose of the presentation, and, therefore, the sum subscribed for the purchase of the album was left in the treasurer's hands, part of which has been appropriated to the purpose of having the presentation address handsomely illuminated on the title-page, and the remainder of the subscription it had been resolved should be presented to Mr. Gough in a purse, as the committee had not time to decide upon the most suitable way of spending it. He then called upon

Mr. Smith, the vice-president, to make the presentation, who, on rising, said he knew of no more pleasant duty than that of indicating the respect and esteem in which we held another person, the more especially when the person had undoubtedly proved himself worthy of such esteem; and such a position was the one then occupied by the late president of the Society. He (Mr. Smith) then went on to say, parting with dear and admired friends always left on the mind very painful reminiscences, especially when such friends had occupied a high and useful position, and when valuable services had been rendered by them. When a scheme was launched, it appeared a simple undertaking; but to look on it achieved, and actually do the work, were two very different matters. Mr. Gough had energetically set himself the task of establishing a society in Yorkshire; he had had many difficulties and trying circumstances to contend against, but had at last the satisfaction of looking on his completed labours—an established and prosperous society What changes the future might work was unknown to them all; but he hoped Mr. Gough would return in full health and vigour, and show them many examples of his work in distant countries. They (the members of the Society) owed him a debt they could not pay, nor had they met that evening with any intention of endeavouring to pay it, but simply to hand over a small memento of their large affection for the recipient. The gift must not be measured by its intrinsic value, but by the intentions of the donors, as indicating their profound feelings of obligation to the retiring president, to whom it would doubtless be a pleasure to look upon the "counterfeit presentment" of those with whom he was accustomed to meet; and he had no hesitation in saying that the members one and all sincerely hoped they might again, after the lapse of time, have the pleasure of seeing Mr. Gough's face and enjoying his company for many years to come. Mr. Smith then read the address, which was superbly illuminated on the title-page of the album, as follows:—"Presented to J. W. Gough, Esq., by the members of the West Riding of Yorkshire Photographic Society, as a slight intimation of the esteem in which he was held as its president and founder, at the same time wishing him every success in his Indian undertaking."

The album and purse were then handed to

Mr. Gough, who, in replying, said he felt deeply the feelings which had prompted the (to him) unlooked-for gift. He had been connected with many photographic societies, but had never met with more good fellowship and genuine friendship than during his connection with the West Riding Society. There were, he was convinced, no warmer hearts than those of Yorkshiremen, and he should feel, as he looked over the collection of portraits just presented to him, that each one was his personal and intimate friend; and he certainly, during his stay abroad, should communicate with the Society, and consider himself as one of them; and concluded by saying that he rendered his deep and heartfelt thanks for the valuable and interesting memento of his connection with the Society.

The meeting then became of a social character, and an extremely pleasant evening was spent by those present, the proceedings being interspersed with speeches and songs by several of the gentlemen present.

Talk in the Studio.

South London Photographic Society.—Our notice of the popular meeting of the South London Society was omitted, by accident, last week. It is only necessary to say that the meeting was pleasant and successful, thanks to Messrs. Howard, Brooke, Wilkinson, and York, for the loan of charming lantern slides, and to the president's explanations from Mr. York's *Lantern Readings*. The capital lantern of Mr. Hughes, of Hoxton, was used.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—The second annual meeting, held on Monday night, was, we are informed, in every way pleasant and successful, the entertainments giving much pleasure.

RISKS OF SITTERS.—The *New York Times* is despondent in contemplating the consequences of the verdict which says a sitter may not waste a photographer's time and material in taking seventeen negatives without any payment, and forthwith sees the unwary public become victims to the full sway of the ruthless portraitist. It says:—"The public is now informed precisely what it has to expect from photographers. The man who happens to enter the gallery of a young photographer with plenty of leisure, must expect either to pursue, through perpetual sittings, the phantom of a likeness he can never overtake, or he must accept the result of the photographer's first experiments, and leave the gallery before he is financially ruined. In either case, he must pay for his picture, or pictures, whatever liberties the camera may have taken with him. When this is fully understood, there will be an immediate decrease in the number of people who are willing to risk their fortunes and faces in photograph galleries. Indeed it is possible that the decision over which photographers are now rejoicing may lessen their business, so that it will prove an injury rather than a benefit to them. Time will show what the result will really be. Meanwhile, photographers will hunt in their work-rooms for rejected negatives, and summon the rejectors to appear and undergo further experiments, or else to pay for glass, time, and chemicals consumed in their service."

HAPPY LOT OF THE PHOTOGRAPHER.—We had been accustomed to think of the photographer as a being who might justly form an exception to the philosophic axiom that no man should be called happy before his death. Contrasting his placid vocation with the feverish toils of other men, the lot of the photographic artist seemed an altogether blissful and rose-coloured existence. To say nothing of the amenities which he daily exchanges with the fair sex, the gratification with which he hears his portraits praised, and the philosophic views of life which his ever-changing procession of visitors is so well calculated to impress upon him, the work itself is so elegant and gentlemanly, so free from vulgar perspiration, that verily the photographer would seem to challenge all trades and professions for the palm of *otium cum dignitate*. The directing the nose of the photographee toward a certain point, a caution against sneezing and the like, a hiding of himself for a few moments behind that mysterious black cloth, its sudden withdrawal, and, presto, the swain in all his glory, or the maid in all her charms, stands, or rather sits, "confessed," and will very soon be ready for distribution among "mutual friends."—*Brooklyn Eagle*.

To Correspondents.

NORTH LIGHT.—The light in the south side of your studio would be more useful in the side than in the roof. About seven feet would probably answer. It may commence about seven feet from the background end of the room. Something, however, depends upon the usual position of your sitter. You may ascertain the best position by taking a good sized white screen, and moving it about, watching at what position it best lights up the shadowed side. Then put in the glass in a similar position.

AN AMATEUR.—No formula for the precise proportions of nitrate of uranium in the silver bath has been published. Its use is in an experimental stage, and its results in general operations, and the best proportions, must be learned by experiment.

S. E. W.—Your description of a "solution of gold alloy containing silver and copper" is somewhat indefinite. If the solution contains gold, it is some salt of gold. Which? One naturally concludes in photography, when you speak of a "solution of gold," that a solution of chloride of gold is meant; but if so, it will not contain silver, as the silver would be converted into a chloride and thrown down. If it be a solution of chloride of gold containing copper, the addition of carbonate of soda will throw down the copper as a carbonate. Possibly, your safest plan will be to throw down the gold by the addition of protosulphate of iron; wash with diluted sulphuric acid to remove traces of iron and copper, and re-dissolve the gold, which is in the form of a black metallic powder, in nitro-hydrocloric acid in the usual manner, as we have often described.

JOHN CHURCH.—Mount about half an hour after placing the print on the glass. Some photographers, after attaching one or two pieces of thick paper to the back of the print whilst on the glass, finally mount on card when dry by merely attaching the edges to the card, using a little strong hot glue for so attaching the edges. 2. Your carbon print is pretty good, with the exception, of course, of being much too dark. Strong paste answers well for mounting carbon prints.

R. M. B.—The streaks are probably due to the accumulation of scum on the surface of the nitrate solution. Every morning, before commencing to work, it is important to look to this, and the more especially if fresh solution have been added to the remainder in the bath, for then the dried and partially reduced solution on the sides of the bath, being washed off by the increased bulk of solution, readily forms a scum, which causes streaks in the direction of the dip. A few strips of clean blotting-paper drawn over the surface of the solution will remove the scum, and so you will get rid of the evil.

R. M.—The old, old story. Your prints are bad examples of imperfect fixation. It is manifest you have been using the same fixing solution over and over, until it is exhausted, and possesses no solvent power on the salts of silver. Always use a fresh solution for every batch of prints. And remember that if the temperature of the solution is very low, which it is apt to be in cold weather, the solvent power is much decreased.

TYRO.—You will find full details of the manufacture of collodion in our back YEAR-BOOKS. There is no serious difficulty in making pyroxyline; but some experience is required to secure success, and there are various risks, not only of failure, but, unless care is taken, of some personal injury. Occasionally decomposition will commence in the jar of mixed acids, which, spurting out on the hands of the manipulator, produces dangerous wounds; or red fumes being evolved, there is risk of suffocation, and so in various other details. Experiments in the manufacture of collodion are very interesting; but, as a rule, you can secure a better sample with less trouble and less cost by purchase.

W. KURTZ.—Many thanks. We will write.

ERRATUM.—In Mr. Brothers' letter in our last, on photographing the spectrum of the corona, an error occurs. In the second line of the second paragraph, for the phrase "operation of the corona," read "spectrum of the corona."

Several Correspondents in our next.

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METEOROLOGICAL REPORT FOR DECEMBER.

BY WILLIAM HENRY WATSON.

Date.	Barometric Pressure. Morning	Noon.	Night.	Temperature Morning	Noon.	Night.	Direction of Wind at 9 a.m.	REMARKS.
1	29·6	29·66	29·70	32°	36°	32°	N.	Sleet this afternoon
2	29·63	29·60	29·54	34	36	31	N.	A little snow p.m.
3	29·54	29·50	29·49	33	34	32	N.	Fair all day, gloomy
4	29·47	29·6.	29·70	31	34	28	N.E.	Fair, but gloomy
5	29·73	29·77	29·80	27	31	26	N.E.	Fair and bright
6	29·9	29·96	30·00	29	34	32	N.	Fair, clear, and bright
7	30·14	30·10	30·11	32	36	32	N.N.W.	Fair, but gloomy
8	30·12	30·12	30·10	32	34	32	N.E.	Fair, but gloomy
9	30·08	30·05	30·03	31	36	33	N.E.	Fair, but gloomy
10	30·00	29·94	29·80	32	42	40	N.W.	Fair, but gloomy. Foggy.
11	29·8	29·79	29·74	42	44	44	N.W.	Rain a.m.
12	29·72	29·77	29·81	44	46	46	W.N.W.	Rain p.m.
13	29·80	29·83	29·86	43	44	42	W.	Fair, but gloomy
14	29·80	29·79	29·75	40	41	37	W.	A little rain this morning
15	29·76	29·78	29·78	40	44	44	W.	Rain this morning
16	29·75	29·73	29·70	36	39	39	N.W.	Fair, but gloomy
17	29·61	29·56	29·50	39	42	46	N.W.	A little rain a.m. and p.m.
18	29·43	29·43	29·37	45	46	46	S.W.	Fair, but gloomy
19	29·20	29·18	29·10	46	47	46	S.	Rain a.m. and p.m.
20	29·10	29·09	29·16	45	46	45	S.W.	Small rain all day
21	29·2	29·20	29·10	44	46	47	S.W.	A little rain this afternoon
22	29·04	29·07	29·18	48	50	43	S.	Rain a.m. and p.m.
23	29·30	29·35	29·40	41	48	43	S.W.	Fair, but gloomy
24	29·65	29·59	29·70	46	47	46	S.S.W.	A little rain this afternoon
25	29·83	29·98	30·04	44	47	45	S.W.	Fair and sunny
26	30·03	30·08	30·07	44	47	46	S.W.	Rain a.m. and p.m.
27	30·0	29·99	29·96	43	47	46	S.	Showers a.m. and p.m.
28	30·10	—	30·08	44	—	45	—	A little rain this afternoon
29	30·00	29·99	29·98	47	47	46	S.W.	Fair, but gloomy
30	29·91	29·87	29·81	46	48	44	—	Rain a.m. and p.m.
31	29·70	29·61	29·56	44	44	43	S.	Rain a.m. and p.m. Heavy, with wind, at night.

Summary.

	Mornings.	Noons.	Nights.
Maximum temperature observed	48° ...	50° ...	47°
Minimum ditto	27 ...	31 ...	26
Mean ditto	39·6 ...	42·1 ...	40·3+

Mean of whole observations	40·6
Number of days on which rain fell	17
Number of fair days	14
Fair days on which it was gloomy	11
Fair days on which it was sunny	3

The Photographic News, February 4, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

The International Exhibition of Scientific Instruments—Sir John Jenkins, the Photographer—Influence of Coloured Light upon Vegetation.

The International Exhibition of Scientific Instruments.—We shall be curious to see the International Exhibition of Scientific Instruments when it is opened at South Kensington. One feature, and the principal one, we believe, of the Exhibition, is to have such instruments as have served in the development or discovery of a great scientific fact; and strenuous exertions have been made to collect from all nations apparatus which was used by scientific men, past and gone, in their experiments. Thus the Italian Government have been asked to lend the identical instruments, if they exist, which were employed by Galvani and Volta in making their electric researches, in the same way as the old magnet of the Royal Institution, by means of which Faraday discovered magneto-electricity, will, no doubt, form an item of the Exhibition. Many of these relics will, no doubt, possess some little interest; but we doubt—even in the event of a numerous collection being got together—that they will have any attraction for the general public. Scientific instruments, on the other hand, of the most approved design and latest elaboration will be interesting to many, supposing their use is sufficiently apparent, or they are simply and lucidly explained in brief terms. But we suspect that the early essays of most scientific men undertaken in a new branch of science are rarely made with apparatus that can afterwards be exhibited; and it is only when the first principles of a discovery have been established that we get anything tangible. It is not likely, for instance, that the pile of metal plates from which Galvani first developed electricity are still in existence, although several batteries may have been constructed subsequently to the discovery, to show more perfectly the electric action. Even were such a thing extant, and it was sent up to Kensington, beyond a few students of electricity there would be few interested in the matter, and these would look at it more out of simple curiosity than in any other light. How many spurious things of the kind will be forthcoming now that it is generally known that old scientific apparatus is at a premium, goodness only knows; but we shall be very sorry to pin our faith to all the relics brought together at South Kensington this summer. We may call the attention of the authorities to the circumstance that an old camera has just been found somewhere in America, with the name of Daguerre written inside, which, no doubt, could be purchased for a consideration; but we doubt if many photographers would flock to see it, were it exhibited at South Kensington. Indeed we hardly think that the exhibition, under any circumstances, will prove a successful opposition to the "Old Masters" at the Royal Academy. A scientific man has little to show, for the apparatus with which he conducts his investigations is rarely worth looking at, and it is his brains rather than his tools that are subject for wonder. However, there is the money from the Great Exhibition of 1851 lying idle, together with a large staff of officials, and so, perforce, it is necessary to get up an exhibition of some sort; and, perhaps, one of scientific apparatus is as harmless as anything else. It is better, certainly, than converting the Albert Hall and its dependencies into a gigantic shop or bazaar, as was the case during the last two or three international exhibitions. The South Kensington officials have been invoking the aid of every civilised nation, apparently, to carry out this latest idea, and for some time past we have been startled in the newspapers by telegrams about the International Exhibition of Scientific Instruments. We sincerely trust that in the end there may be something worth looking at, after all this to-do; but, as we said before, we are by no means sanguine of the success of the affair.

Sir John Jenkins, the Photographer.—"Mr. John Jenkins, of Dipwell, photographer to the Queen, has, in acknowledgment of the successful artistic pictures he has taken of Windsor, Richmond, and the neighbourhood, been nominated by Her Majesty a Knight of the Royal Victorian Order." What would photographers say to such an announcement if it really were a fact, and not merely an adaptation of a statement from a German contemporary? We think, ourselves, it is rather a subject for congratulation that we do not in this country shower honours upon photographers, and authors, and actors, as is the case in the great Fatherland. We should scarcely think any the more of Mr. John Jenkins' productions because their author happened to have received the honour of knighthood, especially when we knew that he was no more deserving of such a distinction than his brethren. When a man is awarded a medal by a jury of his fellows, we may honour him, and make much of his works, for those who have sat in judgment upon them are practical men, well qualified to make the award. But it is a different matter when the whole affair depends upon friends at Court, when it is not so much a question of one's merit, as having that merit put forward prominently by one of the Court flunkies. Some time ago the London press discussed the question of conferring honours of this kind on civilians very fully, and commented in approving terms upon the refusal of Thomas Carlyle and the Poet Laureate to accept the baronetcies which the Prime Minister had offered them. A man in the position of Thomas Carlyle could gain nothing in fame or prestige by the prefix of "Sir" and the suffix of "Bart.," and it is a question whether such a title would not have a tinge of the ridiculous in it, coming after a man had made for himself a rank—not in England, but in the world—far higher than the one which the Crown proposed to confer upon him. Had Thackeray been a knight, or Dickens a baronet, one would never have thought of speaking of them by their titles, any more than it is customary to call the late Lord Macaulay by any other name than his original one. When a man is a peer and nothing else, it is a different thing, and only right and proper that his full titles should be announced, for that is just his *forte*, as an American humorist was fond of saying; but when a man has some other *forte* beyond being the son of his father, he is never so particular about this latter qualification. At the last great International Exhibition at Paris, the order of the Legion of Honour was freely distributed among exhibitors, and the same thing happened at the Vienna Exhibition, when Franz Joseph orders were to be gathered as plentifully as blackberries. Instead of conferring honour on the recipient in cases such as these, it only brings ridicule upon the honour itself; for a soldier would scarcely care to receive the same recompense for an act of bravery in battle, as that awarded to a shoemaker who makes elegant boots. With a man who works with his brains, honours of this kind will never bring much good, and the work of authors and artists will not live the longer because their producers had rank conferred upon them. The true man will always value a position earned by himself far higher than one which fortune and good luck have brought him. On the whole, therefore, we do not think that photographers in this country are much to be pitied because they have no chance of receiving a distinction from some Royal or grand ducal personage.

Influence of Coloured Light upon Vegetation.—Some further experiments have been undertaken, upon the influence of different coloured lights upon vegetation, by M. Rudolf Weber. Peas were grown, after soaking two days in distilled water, in quartz sand, and fed in all instances in the same manner, some growing under window glass, others under red, yellow, green, blue, and violet. Photographic paper exposed from three to four hours under the different glasses was acted upon most under the blue and violet next to the white; under the green and yellow it was but slightly affected, and scarcely at all under the red. The seedlings had the benefit of full sunlight shining upon them. The plants under the green and violet glasses grew with much longer stems than those under the white or yellow, but the breadth of their leaves was small. Under blue glass, the plants had long twisted stems, but dark green regular leaves, as also those under red glass. Next to the plants under white glass, those under yellow had the best developed leaves. M. Weber gives the weight of the different plants, which decreases in the following order: those grown under white glass were heaviest; then follow yellow, red, blue, violet, and green.

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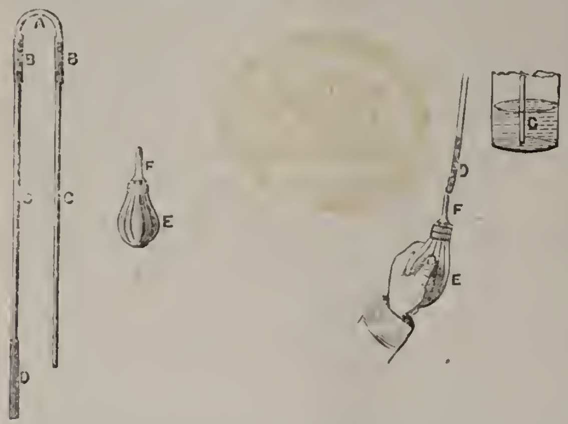
EMPTYING SILVER BATHS, ETC.

BY MARSHALL WANE.

The accompanying drawing represents a syphon as made and used by me with perfect success for removing silver solutions from baths, bottles, &c.



To make the above syphon, procure glass tubing the thickness of an ordinary black lead pencil (one-quarter inch) cut in three lengths, viz., 22½, 19½, and 6 or 8 inches respectively. Take the six-inch length between the thumb and finger of each hand, and hold the centre over a gas flame until it becomes sufficiently hot to bend into form A; then attach pieces of india-rubber tubing, BB, four inches in length to each end of A and CC, as shown in diagram; then join to the longer piece of glass tube a piece of india-rubber tube, D, six or eight inches long.

To work the syphon you also require an india-rubber bottle, E, with bone tube, F, size of bottle three inches diameter by five inches in length, tube two and a-half. It is important that the bottle should not be smaller, or it will fail to exhaust the air from syphon. With this arrangement it is now ready for work, as follows:—

To empty a bath, insert tube of india-rubber bottle F into rubber tube D, squeeze the bottle E to exhaust the air, then place the shortest length of syphon into bath, G. Release the rubber bottle which exhausts the air from syphon, and causes the solution to flow over the top of bent tube; but to prevent the solution entering rubber bottle, press the tube D with finger and thumb of left hand, withdraw rubber bottle from tube D, and run solution into stock bottle or bottles.

The whole cost of this syphon is not more than five shillings, the rubber bottle being the most expensive, costing four shillings (I got mine second-hand for one shilling); the glass tubing about sixpence, procured from any chemist; and the tubing from an ironmonger or other place, with the wire drawn out, and the tube washed with clean water.

I may remark that my reason for using india-rubber tubing is to give greater facilities for decanting, and with less chance of breakage, as the rubber tubing allows it to be bent to any position required.

PS.—This syphon is not the subject of a patent.

FRENCH CORRESPONDENCE.

French Annuals: The Agenda and the Aide Memoire: Boivin's Dry Process—The Formulæ and Mode of Preparing the Plates—How to find out whether Carbon Tissue is Insoluble.

From 1865 to 1868 M. Davanne published an *Annuaire Photographique*, the disappearance of which of late years has been much regretted. Since then no one has come forward to supply the position M. Davanne vacated, and it was with feelings of satisfaction, therefore, that one heard that M. Leon Vidal proposed to publish at the end of 1875 an *Agenda* specially destined for photographers, to take the place of the Davanne annual. M. Vidal also announced that his volume would contain a number of practical formulæ and hints useful to operators. At the same time an amateur in the provinces, M. Fabre, the secretary of the new Photographic Society at Toulouse, announced to the public a similar publication under the title of *Aide Memoire*. At the present moment the *Agenda* is in the press, and the *Aide Memoire* has appeared.

The work of M. Fabre is of the same character as the *Annuaire* of M. Davanne, but it contains more matter, and offers more variety. It is a little volume of about 300 pages. It contains, among other things, a list of all the photographic societies in existence, together with the names of the various photographic journals that are published; a list of patents for novelties and improvements taken out in France in connection with photography; a review of the work accomplished during the year that has gone; a series of practical hints to beginners in the art; a series of useful formulæ; a list of the principal photographers; and, finally, a diary and a large number of advertisements find a place in the *Aide Memoire*.

Two illustrations ornament the volume: one is a very fine instantaneous view from a cliché of M. Dellon, a Toulouse photographer. The printing is done in greasy ink upon gelatine paper by M. Quinsac (of the same town), and the picture is one which does great credit to both gentlemen concerned, while it proves that the new processes are making their way everywhere. The other illustration is a child's portrait printed by a photo-lithographic process by M. Geymet, the details of which that gentleman has published; he now works the process as an industry. The model is very delicate, and the half-tones have retained their original beauty.

I have entered into the details of this work at length, in order to show the difference between the photographic annuals that are published in France and in England. The Year-Book, for instance, contains a considerable number of original communications addressed to the Editor by the principal amateur and professional gentlemen in Great Britain; it is a collective work, to which everyone contributes a little of his scientific knowledge and experience. With us, on the contrary, such works must be entirely personal. We have neither the spirit of collaboration nor of association. Everybody appears to wish to keep for himself whatever he may have learnt from his everyday work, quite forgetting that by a system of exchange he would gain a bushel when he sacrificed a grain. Unfortunately, this is a trait in our national character which it is difficult to alter or to modify.

The short account which I gave in my last letter of the dry collodion process of M. Boivin has brought two letters, which the readers of the Photographic News have had the honour to address me in order to obtain more ample details. As other readers may be possessed with the same desire, I take this occasion to reply to the two letters in question.

In the process which he has now practised for many years, as it was in 1866 that he first published the details of it, M. Boivin completely reverses the practice of the ordinary process. He puts his silver into the collodion, and makes up his sensitizing bath with iodide of potassium; this produces the film of iodide of silver destined to support that obtained by the varnish composed of iodised albumen. He has in this way, by one sensitizing action of the silver bath, two films of iodide of silver, the one in the collodion, the other in the varnish. He prepares his plates in full daylight, iodide of silver formed in the presence of an excess of iodide of potassium being insensitive, while photogenic iodide of silver is only formed with an excess of nitrate of silver. It is this property which he has made use of in preparing his plates in daylight, obtaining, at one operation of sensitizing, two photogenic films upon the same glass plate.

The albumen varnish is coagulated by the aceto-nitrate silver bath, and retains and fixes the collodion upon the glass. One need not fear, therefore, the rising of the film during washing, which often occurs with other processes. Moreover, the clichés obtained are rarely fogged.

I may here repeat the formula of the process:—

Collodion.

Alcohol	40 cub. cents.
Crystallised or fused nitrate of silver	1 gramme
Ether...	60 cub. cents.
Pyroxyline, soluble... ...	1 gramme

Alcohol and Ether Mixture.—To render the collodion more fluid.

Ether...	60 cub. cents.
Alcohol	40 ,, ,,

After the plate has been collodionised, it is plunged at once into a bath composed of—

Distilled water	100 cub. cents.
Iodide of cadmium	2 grammes
Iodide of ammonium ...	1 gramme
Iodide of potassium... ...	2 grammes
Bromide of potassium	1 to 2 ,,

The plate is then washed with rain-water, drained, and treated twice with the undermentioned compound:—

Albumen of six eggs ...	20 cub. cents.
Distilled water	90 ,, ,,
Grape sugar...	6 grammes
Dextrine	6 ,,
Iodide of potassium... ...	1·50 ,,
Iodide of ammonium ...	1·50 ,,
Bromide of potassium ...	·90 ,,
Bromide of ammonium ...	·90 ,,

A few drops of liquid ammonia and a few grains of iodine are added.

The plate is then allowed to dry, and it is sensitized with—

Crystallized or fused nitrate of silver	6 to 8 grammes
Glacial acetic acid ...	8 to 10 ,,
Distilled water	100 cub. cents.

Washing with rain-water follows, and the plate is then dried in darkness.

M. Boivin estimates the time of exposure for plates thus prepared at one minute for every eight centimetres of focus for a landscape lens or one with a small diaphragm.

Before developing, the plate is plunged for a few minutes in the water that was used for washing the plates in the last instance, and then it is put into a bath of—

Gallic acid solution (4 parts in 1000 water)	20 cub. cents.
Pure rain-water	20 ,, ,,
Acetate or phosphate of soda solution (5 per cent.) ...	5 grammes

If the development is slow, add a few drops of a two per cent. nitrate of silver solution. When the details have come out, intensify slightly with—

Pyrogallic acid	1 gramme
Distilled water	250 cub. cents.
Glacial acetic acid ...	10 to 15 ,, ,,

If the impression is grey, the following solution is employed:—

Pyrogallic acid	1 gramme
Glacial acetic acid ...	1·50 to 2 grammes

Finally, if the cliché lacks detail, it is put back into the gallic acid bath, containing a little nitrate of silver. The cliché is fixed in the ordinary manner with hyposulphite of soda.

In the little volume which he has just published M. Boivin indicates a very simple means of examining, before employment, the pigment tissue employed in the carbon process, in order to prevent mishaps, which are often encountered in this method of printing. Into a vessel is placed a few cubic centimetres of water, together with a small piece of the paper to be analysed. A mild heat is applied, and if the tissue has preserved its properties, the pigment film soon dissolves. If, on the contrary, insolubility has set in from some reason or other, then the tissue is of no value for printing purposes. Ernest Lacan.

PRACTICAL HINTS.

BY M. SCHÆFFNER.*

The Studio.—In towns where it is so difficult to find a suitable site, the disposition of one's studio depends mostly upon chance. The photographer cannot alter very much the construction of any studio that he may rent. But when he has the good fortune to be in a position to construct a studio for himself, these are some of the points to be considered.

The terrace, or site, should not be less than eight metres† long; its height for the posing portions of the apartment should be about four metres. Three metres length should be of this height, and the remaining five metres of the room need be only three metres high.

The posing field should face the North, and the lighted side should, by preference, be the East. The inclination of the roof should be greater the farther one is distant from the poles; in Vienna, or in Paris, for instance, the average should be an angle of thirty to forty degrees.

The glazing of the studio should be of white glass. Inside there should be a double frame of ground glass, sliding in grooves, to form a screen, and modify the intensity of the light at times.

The studio should be painted very dark blue inside, or from café-au-lait tint to a chocolate-brown, according as the studio is situated near the equator, or in a temperate climate.

The background, the curtains, the furniture, accessories, &c., should be of the same tint as the colour employed in the decoration of the studio.

The Camera.—As soon as one can bear the expense, it is well to have a camera constructed of polished walnut or acacia wood, of bellows design, with protected corners. The dark frames should have a curtain, if their size surpasses thirteen by eighteen centimetres. The stand should move upon a double rack, and the table rest on castors. All the wooden apparatus, such as the printing frames, &c., should be made from oak or beech, of the best qualities.

Lenses.—The choice of a lens is of the highest importance, and presents many difficulties. The name of the optician should never be regarded as sufficient reason for purchasing a lens; neither does the place of its manufacture afford any criterion.

Certain houses in London, Germany, and Paris owe their reputation simply to the absence of any competition in the manufacture of the instruments; and by reason that *noblesse oblige*, they, for their own interest, usually supply good and sound articles. But sometimes, and not unfrequently, too, these firms send out very defective workmanship.

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* *Moniteur de la Photographie.*

† A metre is about thirty-nine inches.—Ed. P.N.

The reason for this is, that there is no infallible guide to be observed in the production of photographic instruments. The curve to be given to the lenses is not very precise, and if the material is easily chosen, it is not to be met with always in sufficient quantity. The diameter of lenses is quite a question of fashion, and their focus is rarely in proportion.

For instance, a lens three inches and nineteen centimetres focus, if properly constructed, has, in reality, but one special property, that of being rapid. As regards its lines and drawing, it simply produces monstrosities. I will repeat, therefore, that no matter what name is upon the lens, and no matter whence it comes, it is good if it has no chemical focus, and if the glasses are of a fine white material, and sufficiently well polished to appear black by reflection. Air-bubbles, if not too large, constitute but a slight defect.

For half-plate pictures the mean focal length should be 12 to 18 centimetres; 22 to 27 centimetres for three inches, and 40 to 60 for four inches. In the case of view or copying lenses, only aplanatic, rectilinear, or globe instruments should be employed. These give images with very straight lines, and they have considerable depth of focus.

Laboratory.—Solutions like that of nitrate of silver and the developing liquids should always be stored in glass or porcelain vessels. Gutta-percha and ebonite have a destructive action upon the nitrate of silver bath, to which photographers owe many of their difficulties. For printing purposes, the utensils may be of gutta-percha or hardened cardboard (*carton durci*), the latter being much preferred to glass in fitting up a travelling equipment.

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A DRY ALBUMEN PROCESS.

BY F. M. PICKERELL.*

Coating for the Glass.

White of eggs	4 ounces
Honey	3½ ,,
Iodide of potassium	60 grains
Bromide of potassium	15 ,,
Dry salt	5 ,,

Place all of the above in a large bowl, and with a wooden fork beat them into a thick froth, then let them stand twenty or twenty-four hours to settle. When settled, filter through four or five thicknesses of cambric into your coating bottle.

After the coated glass has been carefully heated over a spirit-lamp, it must be allowed to get perfectly cool before plunging into the silver bath.

Silver Bath.

Distilled water	1 quart
Nitrate of silver	4 ounces

When the silver is all dissolved, add six ounces of No. 8 acetic acid, shake well for a few moments, then filter through paper.

The albumenized glass is to be plunged into this bath quickly, and allowed to remain there for ten seconds; it is then taken out, washed thoroughly, and placed upon its edge in a clean and dark place to dry.

Developing Solution.

Have ready in a pint bottle a saturated solution of gallic acid, and in a four or six ounce bottle a solution of the nitrate of silver, say five grains of silver to each ounce of water. When you wish to develop a picture, pour into a wide-mouthed two-ounce bottle as much of the gallic acid solution as you think will cover your glass, to this add a very little of the silver solution, shake them together, then flow your plate, and the picture will soon begin to appear.

This solution is to be allowed to remain on the plate until the image is fully out in all its detail. Then the negative is to be well washed, after which it is ready for the

Hyposulphite of Soda, or Fixing Solution.

Water	16 ounces
Hyposulphite of soda	4 ,,

Dissolve and filter.

This solution is to be allowed to remain on the picture until it is all cleared up. Then wash it well, and place it on some clean paper to dry. When the negative is dry it is ready to print from.

Note 1st. Should small dark particles form on the plate while developing with the pyrogallic acid, you will at once pour off the developer, wash the plate, and pour on new.

Note 2nd. When heating the glass over the spirit-lamp drain all the albumen off you can, but should the film appear thicker at one end than at the other, flow it again, and flow off from the opposite corner, heating as before.

Note 3rd. If you want the plate to work quicker, first coat with collodion, let dry, and then flow with the albumen as directed. Time, indoors, one to three minutes; out-doors, one-half to three minutes; a great deal depends on developing, as it can be over-developed or under-developed according to the amount of time given the exposure.

Note 4th. In developing, place the glass on four wires standing on end, supporting each corner of the plate. A piece of white paper under the plate will enable you to see the image when it appears.

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ON THE NATURE AND REACTIONS OF SOME SILVER COMPOUNDS.

BY SERGIUS KERN, ST. PETERSBURG.*

1. *Silver Sulphite* (Ag_2SO_3).

This salt was obtained in the form of a white precipitate resembling silver chloride, by mixing aqueous solutions of silver nitrate and sulphurous acid. During the preparation of this salt an excess of sulphurous acid must be avoided, because in this case the excess of the acid reduces the silver sulphite. The precipitate obtained is quickly filtered from the solution, and dried over sulphuric acid. In order to obtain the silver sulphite in a more stable state I propose to pass through a concentrated solution of silver nitrate in alcohol a current of sulphurous acid; the precipitate of silver sulphite is filtered and dried.

This silver compound is easily decomposed by heat and water, when the latter is for some time in contact with the salt. Alcohol has no action on this salt At 100° the decomposition of silver sulphite may be expressed by the following formula :—

$$2Ag_2SO_3 = Ag_2SO_4 + Ag_2 + SO_2.$$

This reaction gives very pure silver, which may be extracted by the following manner;—The mass obtained from the ignition of Ag_2SO_2 is placed in a test-tube with ammonia gently heated by means of a spirit-lamp. The silver sulphate then dissolves and leaves the metallic silver in the form of a finely divided powder, which, being collected and melted, gives an ingot of very pure metal.

2. *Silver Silicofluoride* (Ag_2SiFl_6).

By mixing aqueous solutions of silver nitrate and hydric silicofluoride this salt is obtained in the form of a greyish white precipate—

$$Fl_2SiFl_6 + 2AgNO_3 = Ag_2SiFl_6 + 2HNO_3.$$

On precipitating the same salt from an alcoholic solution of silver nitrate it was observed that the precipitate of Ag_2SiFl_6 had a darker colour. Hydrochloric acid very easily decomposes this salt—

$$Ag_2SiFl_6 + 2HCl = 2AgCl + 2HFl + SiFl_4.$$

In the same manner acts sulphuric acid, yielding silver sulphate.

According to Berzelius a strong solution of ammonia decomposes this salt; meanwhile it was observed that a weak solution of ammonia produces an unstable gelatinous precipitate, which hangs a long time in the solution, and contains the elements of ammonia.

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* *The Photographic Times.*

* *Chemical News.*

ON ACTINOMETERS.

BY CAPTAIN W. DE W. ABNEY, R.E.

It has been usual in constructing actinometers to take one of two principles—either to produce a tint in open light corresponding to a painted tint, and, therefore, not variable; or else to use different thicknesses of some actinic light-absorbing material, noting where the figure painted over some particular number of thicknesses is just apparent.

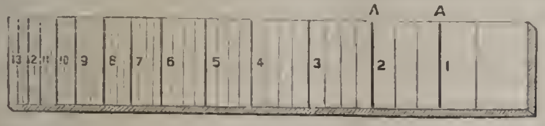
The first method is accurate, as a certain number of tints produced must always mean that the sensitive silver paper has received a certain quantity of actinic light. The latter method is uncertain—much more so than has generally been believed. If the material used cut off *varying proportions of the different actinic rays*, and if the same relative proportions of the light acting be always secured, even then the actinometer does not tell the truth, as will be apparent on a little consideration.

As an example, let us suppose that the material absorbs all the actinic rays excepting three rays of the spectrum, which we will call α, β, and γ, and that of these one thickness allows half of α, one-third of β, and one-fourth of γ to pass, and that their relative actinic powers or capabilities of darkening silver chloride, &c., are as 1, 2, and 3. After passing through one thickness, the total actinic power may be measured by $\frac{1}{2} \times 1 + \frac{1}{3} \times 2 + \frac{1}{4} \times 3 = \frac{23}{12}$, and after passing through a second thickness only the one-fourth of α, one-ninth of β, and one-sixteenth of γ will pass, and this multiplied by the relative actinic powers will give $\frac{1}{4} \times 1 + \frac{1}{9} \times 2 + \frac{1}{16} \times 3 = \frac{95}{144}$.

This series might be continued in a similar manner, and it will be evident that the resulting numbers bear a very complicated ratio one to the other, by no means a geometrical series or anything approaching to it. Now, as a rule, the material employed for making these actinometers allows the passage of many more rays than three, and the final complication becomes worse. It must also be recollected that the light varies in its different components according to the state of the atmosphere, more of the violet and ultra-violet rays being cut off when much moisture is present. Hence this kind of actinometer is to be distrusted except for rough approximations.

The mathematical investigation of absorption exercised by different colouring matters of varying thicknesses is one of considerable difficulty, and not likely to interest the general reader; hence I pass on to propose an actinometer which may be taken as being very nearly correct. If a star, cut out of black cardboard, with points the shape of leaves, be caused to rotate round its centre against an opening in a window with a clear sky behind it, and a negative picture be taken of it, the resulting image will be one of fine gradation, melting from transparent glass to (nearly) opacity. The image should be toned with platinum, four grains to the pint of water, and four drops of nitric acid, when the colour will be turned to a nearly dead black. On examining the rays of light transmitted through this coloured film with the spectroscope, it will be found that the colours are uniformly absorbed. Strips cut from the centre to the outside of the image will give an actinometer which is nearly perfect when graduated.

The graduation can be made by causing the star (the leaves of which, for this purpose, ought to be cut of a definite form, to give at certain distances a proportional diminution in time of exposure) to revolve before sensitized paper, exposing simultaneously a strip of paper beneath the actinometer, and noting in what position similar tints are produced. The points corresponding to $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and so on, of the exposure should be marked on the glass. The time when the exposures are reached in practice may be made by drawing a fine line (A A) in ink across the film. The last white line distinguishable from the ground gives the number of tints exposed.



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BLISTERS.

BY F. M. SPENCER.*

I have practised for more than five years the method of taking the whole batch of prints from the fixing-bath at once, holding them suspended in my hand until quite done dripping, when I place them in a bath of about two and a-half gallons of water in which a good handful of common salt has been dissolved; agitate carefully until the prints are thoroughly separated, and allow to stand five minutes, when the salt-bath may be drawn off and the washing of the prints continued in the usual way. I get no signs of blisters, and have not seen a single faded or discoloured print of my make for years. Thus you will see that my practice is substantially the same as is taught in the "Practical Printer," and which I have seen published more than once years ago, and, since an ounce of preventive is better than a pound of cure, and this particular "ounce" has been so frequently published, I really do not pity him who complains of blisters; but I have a "fellow feeling" for the man who cannot just tell the real cause of blisters. I cannot comprehend how they could be formed by the water under any temperature much below the boiling-point, or by any force without the external surface except the force of vacuum. I have many times observed small bubbles to form upon the print at exactly the same point, when they reached the size of a pin's head break away and disappear at the surface of the bath, only to be constantly followed by new ones, until I have been puzzled to account for them on any hypothesis except chemical decomposition. I have seen these bubbles form in both the toning and fixing baths in the same manner and from the same point in the print. Now the question comes up, What are those bubbles, and what part do they play in forming blisters? If it were necessary that the first wash-water, where the blisters first show themselves, should be much warmer than the hypo bath to produce blisters, I could account for them on the theory of sudden expansion of the gases—*i.e.*, the bubbles; but the proposition or conditions do not seem to depend upon a high or low temperature as a matter of fact. If blisters only formed when the first wash-water was at a lower temperature than the hypo, I could account for them on the theory of a sudden contraction of the surface of the albumen of the print, thereby imprisoning the gases; for the gas or gases would be also subject to contraction, and their formation retarded, so that they would require quite a long time to develop well-blistered prints, whereas every toner knows that they make their appearance with charming rapidity and promptness. It has been suggested that the unequal contraction or expansion of the paper and film of albumen might be the cause, but two forces must needs be overcome upon that basis, the elasticity of paper and film and atmospheric pressure, which is altogether improbable; besides, upon that hypothesis the blisters ought to form at any stage of the process when a change of water involves a change of temperature.

If I were an analytical chemist I would follow up the bubble clue to this Sphynx riddle of blisters, but, being only a practical photographer, it is enough for me practically to know how to get along without the blisters.

One point on washing prints, and I am done. I practise repeated changes of cold well or spring water for at least twelve hours; the water being cool does not easily affect the albumen, does not promote an early decomposition of the hyposulphite of soda entangled in the capillaries of the prints, hence the prints have time to get freed of the hypo salt before a reaction and formation of sulphide of silver can begin.

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* *The Photographic Times.*

The Photographic News.

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THE RELATIVE COMMERCIAL VALUE OF CARBON AND SILVER PRINTING.

It can scarcely be expected that any great revolution can be effected, inconveniencing or injuring some portion of a community, without full and free discussion of the advantages and disadvantages of change. A very complete change in the mode of printing adopted by photographers is believed to be more or less imminent. It is one which must come sooner or later; whether soon or late will probably be determined by a number of circumstances as yet in themselves somewhat uncertain. But in any case it is of vital importance to photographers that they should understand perfectly the case which touches them so closely, and we shall gladly aid in the fullest ventilation of the question. It has, unfortunately, generally happened that in every revolution some individual interests have been inevitably sacrificed, or, at least, depreciated, and it is impossible to contemplate the prospect of injury to the various important industries connected with silver printing without asking if it be necessary. There are two forms of consolation available to those most concerned: first, that the change, whenever it comes, will be a gradual one, probably extending over many years; and, in the next place, as the old industries dwindle and pass out of use, the new ones by which they are superseded will gradually become open to all. Besides, whilst by a natural series of aggregations the principal manufacturing industries connected with the patent carbon processes have fallen into the hands of one company, it is to be borne in mind by those whose trade may be injuriously affected by coming changes that there are unpatented carbon processes which will probably well repay careful working out, and individuals and the art be gainers.

The full and complete discussion of the case in all its bearings, however, before the revolution can take place, is not only inevitable, but desirable, and no apology is needed from any correspondent who throws light on either side of the question. Hence the deprecatory remark at the close of Mr. Bovey's letter on another page, as to the possible allegation that he is personally interested in the maintenance of silver printing, need not be urged. The advocate who has a personal interest in the case he is stating will be more earnest, and do his case more justice, than the mere hireling. The phase of the question which Mr. Bovey especially advances—the relative cost of carbon and silver printing—is one of the utmost importance in forming an estimate of the commercial phase of the question.

Before briefly offering some suggestions on this phase of the subject, there are one or two incidental points in Mr. Bovey's letter which demand comment. He regrets that the advocates of carbon printing have not, as a rule, backed their opinions by the publication of their real names. So far as we remember, there have been very few communications indeed on carbon printing which have not been endorsed by well-known names in photography. But even if it had not been so, it could scarcely affect the matter in any way. There is no greater fallacy than the commonly repeated notion, that an argument is of little value if it is offered upon anonymous authority. If a statement be made in an article that rests upon the credibility of the author, then anonymity may deprive the statement of weight. If an opinion be offered the value of which must depend upon the personal authority of the author, then the absence of his name deprives it of its personal value. But if an argument be offered, or a demonstrable fact stated, these rest on their inherent value, and are in no wise invalidated or weakened by the absence of the name of an author. The mass of the writing in the English press is anonymous, from the *Times* downward, but its weight and influence are in no degree injured thereby.

Another point just demands a passing notice. Accrediting Mr. Hughes with the enterprise of avowing his changed practice, he adds that he has before tried novelties, and abandoned them for the old methods, and that it is not impossible he *may* do so in relation to carbon. A perfectly sufficient answer to this would be to say that he as easily *may not*. But it may be well to point out that Mr. Hughes has before tried new methods of printing, and still continued the old. This time he has tried the new method, and abandoned the old. The fact that in the case of former trials he still retained the old method showed that he was not easy to please, and cautious as to the abandonment of the old method. The fact that after the latest trial he has abandoned the old, and adopted the new, speaks much more potently in favour of the new than if he had never made the former trials to which Mr. Bovey refers.

It is not necessary to discuss at any length the relative excellence of the results produced by carbon and silver. It has been demonstrated years ago that carbon is capable of producing results equal to the best silver prints; but it may be easily conceded that the average quality of carbon prints has not been equal to the best silver standard. It would be strange if it were so, as the excellence of silver printing is the combined result of the experience of thousands of workers, as compared with tens in the case of carbon printing. The latter has had the advantage only of the assiduous attention of a few scientific and practical workers, searching out its best conditions, and overcoming its difficulties, with a degree of success, however, that presents the process now in a fair position for commercial working.

The salient point, however, of Mr. Bovey's letter is the comparative cost of the two methods of producing prints. The point is one of considerable importance, beyond a question; and if, as Mr. Bovey assumes, photographers were asked, at a period when considerable depression prevails, to increase their trade costs without increasing their income, there would undoubtedly seem something of cruelty in the invitation. That the costs of carbon printing are at the present moment greater than those of silver printing, can scarcely, we fancy, be denied. Mr. Bovey's statement of the relative costs of the material, which is fair enough, shows that fact, and for the present it is probable that the operations in carbon printing will require more time and more skilled labour than are at present devoted to silver printing. But it should in no case be assumed, whilst the cost of production is greater, that the prices of the finished work should remain the same. In the majority of cases the public would willingly pay higher rates for a guarantee of permanency in the portraits they value. The greatest bane of commercial photography has been the tendency to an unwise competition, in many quarters, in lowness of price, and the downward tendency has affected in its degree almost every class of studio. With a new style of printing, and the proud claim of permanency, a new scale of charges might, and in many cases should, be initiated, which would considerably increase, instead of diminishing, the photographer's nett income. There are those who affirm that the stigma of instability is largely chargeable with the stagnation in photography as a trade, of which many have occasion to complain. Without endorsing this view, we cannot but think that the bold proclamation of the means of absolute permanency might be made in many cases the means of giving a new impetus to public demand for new portraits, and extensive calls for durable copies of valued treasures now fast fading into the sere and yellow tint of decay.

It is, of course, scarcely probable that the majority of portraitists will themselves at once enter into all the arrangements for carbon printing. Silver printing will be their staple work for some time to come; but as the demand for carbon increases, carbon printing for the trade will doubtless become more accessible, so that the owner of the smallest studio will be able to supply unfading portraits to his clients who desire them; and the revolution from silver to carbon, in which we have before expressed a belief, will probably come so gradually that, whilst many will gain, no existing interest will be conscious of suffering.

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EXPRESSION, POSE, AND LIGHTING IN PHOTOGRAPHY.

Our contemporary, the *Photographische Mittheilungen*, complains that there is no one now to write upon the æsthetic aspect of photography, and the Editor warmly greets the paper of Mr. W. Heighway, recently published in these columns, regarding the author in the light of a benefactor for having taken up the pen.

The *Mittheilungen* says:—"Recently articles upon art and taste in photography have appeared much less frequently than formerly, although it must be admitted on every hand that, in this direction especially, there is much to be done to render both portrait and landscape photography nearer perfection than they are at present. The reason for this is to be found in the circumstance that those who take up the pen are limited in number. There is no dearth of art photographers, but most of them, like great painters and sculptors, do not care about adding literature to their other qualifications. Our lamented friend, Johannes Grasshoff, took up the pen occasionally, but he unfortunately has gone from us, and another capable Berlin photographer, Max Petsch, is no longer busy with the camera. Hartmann, also, his worthy disciple, is occupied too much with other matters to spare time for writing just now.

"In other countries photographic art-literature is much in the same deplorable condition. Since Disderi's 'Upon the Æsthetics of Photography,' nothing else has been written in France, and French pens themselves acknowledge that the country is no longer at the head of photographic portraiture. England possessed three thorough art writers in Lake Price, Rejlander, and Robinson; the two first, unfortunately, are dead, for Rejlander expired last winter; and Robinson's pen is still. In America, it is true, one still encounters papers upon art photography which contain both what is good and what is new; unfortunately, the old saying here applies, that what is good in these writings is not new, and what is new is not good. The whole æsthetic ground of photography lies fallow, and has done so for some time, and under these circumstances we welcome heartily the paper which Mr. Heighway has given us."

All interested in art progress will sympathize with our Berlin contemporary. But it must be borne in mind that the art culture needed by photographers is precisely he culture in most respects which every artist in every work of art must acquire, and the same facilities are open to the photographer, painter, and sculptor. The special arts fitted to the necessities of his position are still from time to time brought under his attention in the photographic press in the country, and our friend Dr. Vogel will be glad to see in our Year-Book, just out, that Mr. Robinson has resumed his pen, and that Mr. Faulkner, an artist of the highest culture and capacity, as well as some other able writers, deal especially with the art specialities and necessities of the photographer.

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ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

Introductory—Carbon Printing and Permanent Prints—The Platinum Process—New Studios—Photochromy—Societies.

In accordance with the desire of our Editor that I should again resume my function of monthly Echoist in the Photographic News—a duty I was obliged to renounce a few years ago through pressure of other engagements—possibly it may interest some of the readers of the News, and save me the necessity of preliminary explanation, if I quote a portion of the Editor's instructions. My duty is, "to furnish a monthly recapitulation, with suggestive notes, of such matters of photographic interest which may have come under my attention in journals, society meetings, studios, or elsewhere, as may seem worthy of a further passing comment." I am also further instructed that I am to avoid making the "gossiping style which is permissible in such Echoes the vehicle for personality, or that kind of offensive comment which always irritates and never instructs." For a moment I felt some sense of mortification when I read this part of my instructions, inasmuch as it seemed to imply that I needed to be warned against being personal or irritating. But I remembered that when a writer under a *nom de plume* obtains permission to "shoot folly as it flies," he is sorely tempted at times to impale the author of the folly as well as his error, and I at once promised to "roar as gently as a sucking dove." My Shakespearian quotation brought another from the Editor in response. "Be not too tame neither," he replied, "but let your own discretion be your tutor." I quote these remarks, from much more to the same effect, simply to show how I am handicapped. I am to be lively without giving offence to the most sensitive; to be instructive without being dull. Well, I will do my best; if I fail, let the circumscribing conditions be blamed, and not the Echoist.

The loudest and most persistent echo of the past month is that which pertains to the triumph of carbon. The cry seems to be, "Silver is dead, and Carbon shall be king!" The progress of carbon has doubtless been rapid of late; but I am not sure that silver is dead, and shall be in no hurry to bury it, remembering the cautionary advice of the philosophic old Scotchman in *Alton Locke*, "It's an unco' gruesome thing, is preemature interment!" As you have pointed out, sir, many of the difficulties of carbon printing have, through the combined efforts of many men, at once skilful and interested, been removed, and the process begins to assume a form of absolute commercial promise. The terms of licence announced by the great firm into whose net all the fish, great and small, associated with carbon patents, seem to drift, are unquestionably liberal—sufficiently so to remove from the minds of fair dealers any objection to pay for a licence. But there are thousands of portraitists in county towns, doing a small business, already masters of silver printing, possibly performed by wife or daughter, to whom the idea of new process, new plant, new experience, would be most paralysing. There are many more who are something like the father who forbad his son to enter the water to bathe until he could swim, and they declare they will not touch carbon until they can produce by its aid prints in all respects equal to silver prints! These, and many more, for various reasons, will use silver albumenized paper for some years to come; so there is little fear for vested interests at present. Of course, the most enterprising photographers will go in for carbon. But there is one important point for all interested in the question to consider. To what extent are carbon prints produced in carbon? The truer term is pigment; and what are the guarantees that the so-called permanent pigments are permanent? Some of the most fugitive pigments most readily furnish the most charming tints. And conceive the humiliation of a "permanent print" fading, and, like the baseless fabric of a vision, leaving not a rack behind! Carbon printers will, of course, guarantee permanency, and, so far, that is well. *Sed quis custodiet ipsos custodes?*

Speaking of permanent printing, I have been much amused by a process which was patented here a year or two ago, but of which little has been heard in this country, suddenly rising into apparent importance in France. The process is ingenious, and has already been described in your pages. Platinum, or some other of the noble metals, forms the basis of the process. A gentleman who signs himself "Professor" Stebbing appears to be deeply interested in the process, and brought it under the attention of the Photographic Society in Paris. As, unfortunately, silver enters into the preparation of the paper, and a bath of hyposulphite of soda finishes the operations, I fear that ingenuity in the process, and fine qualities in the results, will scarcely serve to recommend a trial to photographers.

New forms of studios have been attracting attention lately. One of the most satisfactory in action, of those recently built, appears to be that of Mr. Blanchard, recently erected in Regent Street. If long experience, and a keen perception of the elements of light and shade desirable in portraiture, aid a man, Mr. Blanchard's ought to be a perfect studio. The announcements regarding Mr. Slingsby's new studio have stimulated curiosity, and, if report whisper truly, a new principle, protected by patent, is involved. Mr. Slingsby's reputation as an artist gives great interest to the rumours; and I, for one, shall feel much interest in hearing further details. The mechanical appliances of even masters of the art are not always perfect; but a novelty introduced by a man whose work is really of a high character acquires an interest which even the ambitious announcements of the smaller fry of the art never secure. By-the-way, the really clever and scientific studio invented by M. Vanderweyde has not yet received the attention it really deserves.

The notion of producing photographs in the colours of nature seems to have been abandoned years ago in this country; but attempts at photo-chromy still survive amongst some of our Continental friends. The most surprising of the attempts at photography in colours appears to be that of M. Vidal. This is, confessedly, a system of clever patchwork, the different colours in a given subject being each produced from a different-coloured carbon or pigment tissue, and combined finally in transferring. The process would seem, from description, to be slow and tedious, and quite incompatible with the production for the large numbers mentioned in some of the accounts we read. It is odd, also, that, except in isolated examples, M. Vidal's work has not been seen in this country.

The Photographic Societies seem generally active. One of the most interesting papers read for a long time before the London Society was read at the January meeting by Col. Wortley. It contained, indeed, material for three or four papers. The position he assumed regarding the use of nitrate of uranium in the bath for wet collodion seemed fair and dignified. What a pity he does not go a step further, and give definite working details to enable other experimentalists to work with precision, and verify his results. Regarding his use of sulphate of silver in a bromide emulsion, there is one question I should like to ask. He states that the addition of sulphuric acid to the emulsion liberates nitric acid, and forms sulphate of silver. Will sulphuric acid displace nitric acid in combination with silver, unless an alkali be present? The mechanical appliances for facilitating carbon printing were very capital. The meeting was unusually full of interesting matter. The election of officers a year or two ago, such a bone of useless contention, seems likely to pass over this time without a throb of interest.

The lively and always interesting Edinburgh Society has an Echoist, who gives a resumé of the month, in the able and genial Dr. Nicol; but the temptation to "take a rise" out of some one, unfortunately induced him to tread on Mr. Batho's toes, who, having the right on his side, was ready with a Roland for Dr. Nicol's Oliver. What a pity the Editor stepped in and stopped a fight between two so clever with their weapons!

The South London came out strong in lantern display, as did also the Benevolent Association. At the annual meeting of the latter there was a happy illustration of the concord of the arts, in the fact that photographers, their wives, and sweethearts, were able to present to their friends an excellent musical entertainment, without enlisting foreign aid.

ON SOME FAILURES.

BY WILLIAM BALL.

This article is not intended for the experienced photographer, the chemist, or the optician, but rather for those younger members of our profession who, when they are let loose from the apron-strings of tutor or employer, are generally beset with a legion of failures and obstacles which have never presented themselves to the pupil or assistant operator. In vain the new-fledged operator turns to guide-books: everything there seems plain enough. He searches through "Answers to Correspondents" in the News, but can find no parallel case to his; so he is obliged to struggle through. But the head-aches and heart-burns is what the Yankees term a caution. If, in my early struggles, articles had been written in the News on failures they would have been more eagerly devoured by me than all the essentially scientific matter that I tried to understand. Thus, then, I take a hint from one of your contributors who, some two or three years ago, suggested that if photographers would freely confess their failures, it would tend to promote the advancement of our calling; but I suppose those gentlemen who so freely contribute to impart new wrinkles and improvements in any formula would naturally hesitate to confess that any simple fog puzzled them. I freely confess, then, to failings, and describe them in the hope that they may benefit some one. Although they occurred many years ago, and caused many heart-aches, I do not regret them now, for each one in the end taught a lesson, and perhaps parallel cases may be found at the present time.

We country photographers have not the advantage of gentlemen in the town who belong to societies, having pleasant and instructive meetings. If a photographer in town have a little difficulty, he can ask his next friend if he has not met with similar results, and they tell each other little wrinkles and experiences, which appear little in themselves, but really amount to much when put together. We in the country have not these advantages, but we appreciate your societies, and regret we are prevented by distance from taking a part in them, and feel very grateful for the treat you afford us once a year by providing us with such an excellent exhibition. All thanks to your societies, your exhibitions, and particularly to those gentlemen—brave pioneers and early workers—who have ever been ready to impart freely that knowledge that has cost them hours of toil and brain-work, much time and anxious study, without which many that are now holding high commercial positions who have reaped the advantage of their brothers' labour would be now in comparative obscurity. Knowing, then, to what we are indebted to those gentlemen who have ever been willing to impart and publish such information they have gained in photography for the advantage of the profession generally, I freely send you my small mite; small though it may be, yet should it help or tend to release the worries I have had is sufficient pleasure to think my contribution has relieved it.

Familiar failings I will pass over—such as the various degrees of fog; diffused light in camera, lens, or dark room; pinholes, &c. By-the-by, to refer to pinholes for a moment: once I innocently helped a friend out of that difficulty he had been labouring under for weeks, and had puzzled him sorely. He had tried all the known remedies, and failed; he had lost sleep at night; he had tried new baths, sunned old ones, mixed old and new together, made ginger-beer of the lot by adding spoonsful of carbonate of soda, sunned, and filtered. No use: pinholes in the bath almost produced pinholes on the brain! It was almost intolerable. Having occasion to pass through the town in which he resided, I called, when all his troubles, with a full heart, were poured out. I undertook to review the situation. He showed his negatives with the pinholes, and offered any amount of theories as to their cause. Yet the cause was simple—dust. "No, no," he smilingly remarked, at my poor estimate of his ability; "look at my camera, cleanly wiped out; my operating room, so different to operating rooms in general, not an atom, every particle of perceptible dust removed; bath filtered and skimmed." I asked him to try a plate on me, and noticing a faulty habit of slamming in his dark slide in the camera, I was convinced the fault was there. When he was developing the plate I had another look at the camera, and found the cause. Being an old-fashioned sliding wood camera, where the two slides should join was a crevice of about half an inch; from long use this was well filled with dust, and slamming down the dark slide would raise a gentle cloud, and so produce the pinholes. "How foolish," exclaims the reader, "not to have found such a simple error before!" Yet, confess it, are not most of our troubles, when found out, proved to be almost as simple?

That bath again! We had a boy in our school—an audacious scamp—very difficult to manage; he was always in trouble, or was the cause of it to others; and no matter what complaint came to the master, Charley was looked upon as the delinquent, and, right or wrong, got a whacking. This used to be the case with our bath. In our early days anything at all amiss, it was *that bath* again. I had been practising about nine months in a town where what to me seemed a strange phenomena occurred, from which I did not see that I could get the usual relief by blaming the bath. On applying the redeveloper, a brown deposit showed itself in the middle of the plate. I changed the bath, still the same result; altered my developer, still the same. Nothing left now but to change the washing water. This proved to be the cause; and having always been used for washing purposes, it was not at first suspected. I was not aware of the evils which apparently clear water could produce. It had contained such a great proportion of impurities as to leave a black deposit of silver on the plate, which no after washing could remove. Having no water works, we were depending for a supply from cisterns; this had become so charged with organic matter that, although apparently clear, on a drop of silver being introduced, its foul condition was shown; hence, in the final development, the silver used gave the brown stains. This taught me the necessity of pure water in all our operations.

Having an engagement to produce a series of views for book illustration, I secured a good dark tent that had been used by a gentleman celebrated for his instantaneous pictures. At the end of the first season the series was not completed. In the early spring, on commencing again, I was troubled with fog, which I soon ascertained to be caused by diffused light. The camera, dark slide, lens, &c., were searched, but failed to show the slightest chink. The tent was thoroughly overhauled, and put into condition, yet still there was fog. Where could the cause be? Was it possible to be the ruby glass? Yet how could it deteriorate? It gave no sign of imperfection the season before, and had worked satisfactorily with my predecessor. I tried the tent by closing up the windows and using a taper. The result was satisfactory; the negative was all right, free from fog, and, of course, the window was wrong. I sent up to town for another piece of ruby glass, and started off in the country again. There was no time to try it, as it was not completed till late in the afternoon. A lovely morning next day; I was just in time to catch my train, and arrived at my destination. It was one of those photographic days which are few and far between; the chemicals I knew to be right, the window I had given an extra dose of putty, and if anybody was in high spirits that beautiful spring morning it was the hopeful photographer. But no general who has just lost a battle could have been more crestfallen than I on beholding, on the application of the developer to the first plate, that horrid ghost—that phantom image—showing itself, then gradually receding and leaving all blank fog, thick and impenetrable. Now, where was the fault? This was trying indeed; in fact, I own, worrying. After searching every conceivable place, I failed to discover, and proceeded to pack up my traps a sadder, but not a wiser, man, hesitating whether I should throw them into a ditch or jump upon them. After a smoke—that soothing solace!—I proceeded to finish my packing. Having a powerful focussing-glass with me, I applied it to the new non-actinic glass, when what was my astonishment to find it riddled, as it were, with white specks, showing unmistakably the cause of all my trouble. I felt like the boy who had lost a shilling and found sixpence. I rigged up again, walked to the nearest tavern to purchase a candle, pinned my focussing cloth over the window, and secured good negatives after all. Mark the lesson: double your non-actinic glass.

(To be continued.)

Correspondence.

SIMPLIFIED ENAMEL PROCESS.

Dear Sir,—"An Amateur" has found a new difficulty in photography. I never before heard of a film of collodion floating off the glass in the way he mentioned, when the manipulation was carried out as I described in the Year-Book. The only light I can throw on the subject is in the suggestion that "An Amateur" has read the words "as soon as set" to mean "as soon as *dry*," which is quite another story. As an experiment I would suggest that "An Amateur" should coat a plate with some other sample of collodion (say his ordinary negative collodion if not very old), and plunge it into a dish of water, when the lower edge has just set; if this leaves the glass, there is a new subject open for experiment.

I should, perhaps, add that I do not quite approve of the very thick collodion sometimes used for making the enamel surface; not, however, on account of any tendency to leave the glass in the water, but because I look upon it as a waste of material to use thick where thin collodion would answer the same purpose, and go, perhaps, three times as far.—Yours truly, Nelson K. Cherrill.

THE COMMERCIAL VALUE OF CARBON AND SILVER PRINTING.

Dear Sir,—However opinions might differ as regards other matters, it has been universally conceded that all disputable questions have two sides; that when one side only is presented to view, the other is like to be misjudged, overlooked, or forgotten. For about twelve years, including time present, the famous trial distinguishable as "Carbon *versus* Silver," has been occupying the columns of the photographic journals, and is now unusually pressing in its claims on photographers attention; hence the question will, I presume, be shortly decided whether or not a verdict is to be entered in favour of the energetic plaintiff, whose counsel, brimful of assurance, have, in an unusually long innings, persuaded themselves that the success of their client is a foregone conclusion—that silver printing is on its last legs.

I think it a matter to be regretted that those gentlemen who have taken upon themselves to recommend to photographers the adoption of a new thing, involving considerable trouble and cost, have, as a rule, omitted to back their opinions with real names. Mr. Hughes is an honourable exception, and it does that gentleman no discredit to say that his enterprising spirit has led him to try most new things, and, after a fair trial, he has on some occasions returned back to the old. It is not impossible that a similar experience will attend his printing in carbon.

As regards quality, this being subject to varying tastes, I have no intention, at this time, of challenging comparison any further than in observing that every improvement effected in carbon printing has been heralded with a war blast that challenged the perfection of silver. I have the authority of the YEAR-BOOK, and am, therefore, not presuming, when I say, that for a considerable time no material improvement has been made in silver printing. Then how can we reconcile this fact with what has in the past been so often reiterated, that carbon long since gave results quite equal to silver, yet claims nothing more now. Advocates for carbon have unquestionably a strong case when their arguments rest on the matter of permanency. But, unhappily, this is a plea that must have its foundation on sentiment, whilst photographers are compelled to look chiefly and longest on questions of cost. I am in constant communication with photographers residing in all parts of the kingdom, and I have no hesitation in asserting that the trade, art, or whatsoever else photography is known by, is just now in a precarious position, and if its practitioners can succeed in making ends touch, it is as much as they can do, as a rule.

In questions of the kind herein at issue, it is as well that the truth should be told. If a substantial advantage can be obtained from an adoption of carbon, no opposition to the process would prevent its being generally employed. My sole object, therefore, in renewing remarks on this vexed subject, is to place the matter on a fair footing, and I do so by presenting comparative costs. The public, be it remembered, like to have bulk for their money, and except it can be shown that carbon prints can be produced as cheaply as silver, counsel for carbon might as well whistle to the winds as to endeavour to bring their client into general adoption to the exclusion of any cheaper method of printing.

The subjoined figures I have copied from Autotype Company's catalogue:—Pigmented tissue, 30 feet, 7s. 6d. To use this new material involves cost of an entire new printing plant, which must amount to several pounds, besides fee for teaching, and annual licence. Having no reliable data by which to calculate cost of sensitizing salt, transfer paper, &c., which would be consumed in working up thirty square feet of pigmented tissue, I will simply ask my readers to bear well in mind that carbon printing involves a deal of additional labour, hence nothing like the same number of prints can be produced in carbon as can be done in silver by one hand in a given time (say a day). Now, thirty square feet of the best albumenized paper costs, including postage, 2s. 3½d.; sensitizing solution for that quantity of paper, 1s. 8d. at farthest; gold, 7½d.; hypo, 9d; making a total of 5s. 4d. for the whole cost of working thirty feet of albumenized paper, and a balance on the saving side of 2s. 2d. is thus shown. From a sentimental point of view, of course, money is nothing; but sentiment is poor coin wherewith to purchase bread and cheese. It is very easy to say do away with silver printing, but until carbon can be made to yield to the photographer (when compared with silver) shilling for shilling, it is a cruel procedure to attempt to draw him into expending his money to purchase what will inevitably disappoint in the end.

It will, doubtless, be said that I have personal interests in view. I might retort by stating that the Autotype process is not work of unselfish love. As far as I am concerned in the matter, I am only desirous that photographers should have before them, *pro* and *con*, the whole scope of the argument; and as every question has two sides, it stands to reason that one must be right; and as right must prevail in the end, whether I oppose carbon printing, or not, it will some day reach its true level.—Yours truly, W. T. BOVEY.

CLEANING VARNISHED NEGATIVES.—WRITING LABELS.

SIR,—In your correspondence of last week, I perceive that Mr. Sutcliffe has called attention to the method of cleaning varnished negatives by means of boiling water. About ten years ago I used the method, but found it had one serious drawback: that, unless the glass was removed from the water whilst still very hot, the film would be apt to adhere again to the glass even more firmly than before; so that if one was called away—as frequently happened—on returning, it was nearly impossible to thoroughly clean the latter portion of the batch, small pieces of film sticking to the glass in a most obstinate manner. This difficulty I obviate by throwing a handful of common washing soda on to the plates, and then pouring the boiling water over them. On being removed from the soda solution, they are passed into water slightly acidified with nitric acid, or until you can perceive the acid by the taste; another rinse in clean water, and they will be beautifully clean. I have used this method nearly ten years, and find nothing can be better; having thus used plates many times over with satisfactory results to the last.

Whilst writing, allow me to mention a little dodge which many photographers will find useful. It is simply to use a BB black lead pencil to make labels for the various chemicals in use in the art; it will never fade, as pen and ink labels do; even strong acids—such as sulphuric and nitric acids—have no action on it; and the writing on bottles of such acids will be quite legible long after the paper is quite disintegrated. It is worth a trial.—Yours truly, J. WALTER.

DIORAMIC EFFECTS.

DEAR SIR,—According to my promise I now send you a few observations respecting dioramic and other effects for the purpose of obtaining which the magic lantern is a *sine qua non*. The double lantern or dissolving view apparatus forms the best means by which to show a series of pictures without an hiatus; and it is also capable of exhibiting a great variety of truly magical changes and transformations, when aided by properly arranged pictures and a few simple contrivances. But there are effects which cannot be produced without what is called a trinocular lantern; that is, a lantern having three sets of lenses. For instance, we wish to represent an autumnal scene of a watermill at work; the sky becomes overcast, a fall of snow takes place, and the scene now shows as winter, all objects being covered with snow, and the mill no longer going; night comes on, the moon rises, and a light is seen shining through the window of the mill. It will be found upon experiment that, to show such a series as this properly, cannot be done with only two sets of lenses; sometimes a third lantern is so arranged that it is capable of being shifted gradually to and fro, nearer or further from the screen, as may be required. By such a contrivance, a figure or procession can be made to appear to approach, until it becomes of life size. The magic lantern also lends its aid to the stage effects of the theatre, and by its use a supernatural light is frequently thrown upon a ghostly figure, or a visionary picture made to appear anywhere required, the rest of the stage remaining darkened I may mention here that a most supernatural effect can be produced by throwing the representation of a demon, and from a concealed phantasmagoria lantern, upon rising smoke; and, in this case, the figure will appear dancing.

When the magic lantern is used for scientific purposes, it becomes an instrument of a far higher character than a mere schoolboy's toy, and is capable of demonstrating some of the most beautiful and wonderful philosophical experiments. The microscope, with which every good lantern should be supplied, affords an inexhaustible source of wonder, amusement, and instruction, with its endless changes of form and colour. The kaleidoscope, the polarization of light, and the exhibition of solid objects by means of the opaque lantern, are only a few of the many objects of interest that can be offered as a source of pleasure and instruction to the eye of the intelligent observer. I have often felt much regret that exhibitions of a far more scientific character are not attempted, as they are quite within the range of the powers of the instrument. Even the beauty of pictorial representations might be greatly heightened by the exercise of a little talent and ingenuity combined. Still it is not to be wondered at that men capable of producing subjects original and attractive should seek other sources of remuneration for their labour, as at the present time scenic exhibitions do not seem to be sufficiently estimated by the public, and seldom pay. This is no doubt due in a great measure to the numerous gratuitous entertainments given by amateurs, whose pictures are, unfortunately, too frequently of the cheap and trashy order.

The Prince of Wales's visit to India offers an excellent opportunity for the getting up of a superb entertainment, either in form of a panorama or separate slides, and, if undertaken by talented hands, would prove highly interesting and effective, and I should think it likely to be found an excellent speculation for the next winter season, particularly if accompanied by a well written lecture.—I am, dear sir, yours truly, JAMES MARTIN.

5, *Clarence Place*, *Ilfracombe*.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Tuesday evening, the 25th ult., at the Free Library, William Brown Street, the Rev. J. D. RILEY in the chair.

The minutes of the previous meeting were read and passed, and the newly-elected president, Mr. Wm. Atkins, then entered on the duties of his office.

Mr. George Atkins was elected a member of the Association.

The PRESIDENT, after thanking the members for electing him, then proceeded to read his address, in which he pointed out the various ways the members could advance the art of photography during the coming season. He also advised more practical demonstrations at the evening meetings, and suggested several means and aids by which such demonstrations might be conducted, which would, no doubt, increase the interest of the meetings. He also pointed out the steps which had been taken by some of the members and others in producing, and the advantages which would be derived from having, a reliable actinometer, by which they could with certainty tell the strength of the light in exposing their dry plate.

Mr. PHIPPS said he thought that an actinometer would prove useless in cases where the camera was in the shade taking a brilliantly lighted object or some heavily-shadowed foliage.

The Rev. H. J. PALMER gave an account of a visit he had made to Edinburgh, and the kind reception he had met with from the Edinburgh Photographic Society. He exhibited a spirit lamp, called the "Rechaud" lamp, which he found admirably suited for the purpose of creating a current of air in the drying-box which he used in preparing gelatine plates.

Some fine cloud and instantaneous views from gelatine plates were presented by Mr. Kennett for the Society's album.

Mr. ELLERBECK exhibited a number of carbon stereoscopic transparencies, and also a number of skeleton leaves placed between glass, which made capital specimens for exhibiting in the lantern.

The PRESIDENT then showed some specimens of portraits printed in Woodburytype, and a rubber roller for use in mounting large prints.

A hearty vote of thanks was passed to the *Association Belge de Photographie* for their kindness in presenting the *Bulletin* to this Association.

The members then devoted themselves to the examination of a fine collection of photographs which Mr. O. R. Green had obtained in Italy and Egypt during his "Run for Sunshine."

The meeting was then adjourned.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The annual meeting will be held on Tuesday evening next.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society, on Thursday, February 10th, the Rev. F. F. Statham, M.A., President, will read a paper on "Magnitude as an Element of Attraction in Photography."

MARITIME EXHIBITION AT PARIS.—Mr. David Hedges has recently had a silver medal awarded him for his photographs of marine objects, animals, &c., at the Maritime Exhibition at Paris, at which he was the only English exhibitor.

PHOTOGRAPHERS' BENEVOLENT SOCIETY.—On the evening of Monday week an entertainment in aid of the above excellent institution was given at the Co-operative Institute, Castle Street, Oxford Street, and proved highly successful. The chair was taken by the Rev. F. F. Statham, B.A., vicar of St. Peter's, Walworth, and president of the South London Photographic Society. The first part consisted of a concert, and commenced with an instrumental trio for piano, violin, and viola, well performed by Mrs. Cocking, Mr. T. Sergeant, and Mr. Edwin Cocking. Master Atwood gave a creditable rendering of the well-known piano solo "Maiden's Prayer." Mr. W. Brooks sang the "Bellringer," and Miss Harding gave a pleasant version of "Somebody." Not the least successful portion of the programme was the chairman's clever recitation entitled "New Readings from an Old Author," in which some old friends were presented under new and original aspects. The recitation caused great amusement, and was heartily applauded. Mr. F. Belton sang "Thy Voice" in excellent style, and joined with Mr. Valentine Blanchard in the duet, "The moon has raised her lamp above." Mr. T. Sergeant, a violinist of considerable ability, gave a solo with much taste and finish, and was deservedly encored. Mr. Frank Haes played a solo on the zither, which was very favourably received, and encored. Miss Ward gave a spirited rendering of "The Dashing White Sergeant," and was loudly applauded and recalled. A couple of part-songs were capitally sung by Messrs. Belton, Pearce, Gandy, and V. Blanchard. The first part concluded with a comedietta "The Happy Pair" (Theyre Smith), given with much humour by Miss Ward and Mr. Garrett Cocking. Miss Ward has the advantages of a pleasing voice, and a manner that is sure to find favour with an audience. She only needs study to make her performance thoroughly acceptable. Miss Ward was well supported by Mr. Garrett Cocking. The comedietta was loudly applauded. The second part comprised a magic-lantern exhibition by Mr. F. York, assisted by Mr. Oakley. It proved highly successful. The arrangements, under Mr. W. T. Wilkinson, secretary of the association, were all that could be desired. Mr. E. Cocking was musical director.

PHOTOGRAPHIC REPRODUCTION OF PAINTINGS.—The *Times*, in reviewing some photographs of paintings which have appeared in the Royal Academy Exhibition, says:—"These pictures lose nothing by being rendered in the sober tones of the photograph, and by being, as it were, concentrated in a manner that seems to improve a composition, which, on the large scale, is frequently scattered and comparatively weak. This is always one advantage of a photographic reproduction; if it were inevitably to involve a magnifying of the original, the result would, perhaps, be less flattering to the composer. Another advantage gained is in the better 'keeping' and colouring conferred by the photographic process, which inclines to the repression of violent and prismatic assemblage of colour, and selects, as it were, the light and shade effect of a picture somewhat as the mezzotint artist does in this work. We are, indeed, struck very forcibly, in looking over this collection, with the superiority of many of the translations over the originals, not a few of which have left an impression upon our retina so crude as to be not even yet effaced."

Photographic Canvassing.—A new use has recently been found for photographic portraits, as aids to election canvassing. A provincial contemporary says:—"Daguerre, Niepce, Talbot, and all the other inventors or improvers of photography, certainly never foresaw to what base uses their favourite art would come at last. It was reserved for M. Rouher and his myrmidons to make of it a political agent and an instrument of sedition. But one of M. Rouher's followers has gone even further in the same direction than the grand agent himself. M. Darblay, the Bonapartist candidate for the Senate in the department of Seine-et-Oise, has reduced photography to the degraded level of an electioneering agent. To avoid all troublesome questions and compromising explanations and pledges, M. Darblay, instead of journeying round the department of which Versailles is the capital, has written a short letter to the municipal councillors of the different communes, in which he says:—'Permit me to substitute for my personal visit my *carte photographique*, to which I join my profession of faith.' This is a capital hint even for those candidates in England who have a dread of public meetings, either because eloquence or the will fails them to explain their views on ticklish questions. In future they will merely have to get their photographs liberally distributed through the constituency, or freely circulated through the streets by a legion of sandwich men. The system is found to draw well in the case of circus, music hall, and other public performers; why, then, should it not procure support for a timid or diffident election candidate? No doubt it very much resembles the proceeding of the gentleman who, having an eligibly situated house to sell, carried half a brick about with him as a sample to show to intending purchasers; nevertheless, M. Darblay deserves credit for his ingenious introduction of the electoral 'counterfeit presentment.'"

Photographic Papers.—The *Stationer* wonders why paper makers have troubled themselves so little with the improvement of papers particularly adapted to the special requirements of photography and chromo-lithography. All connected with these two trades well know that in the first days of the photographer's exertions selection of papers had to be made from the ordinary stock of the stationer, and that the older makers' articles proved the most suitable for the work. Demand has, however, so increased that great attention is devoted to the manufacture of chromo paper abroad, the time, unfortunately, it is neglected at home. The "Société d'Encouragement" of Paris offers a prize of two thousand francs, to be awarded in 1880, for a good, and, we presume, the best photographic paper.

Trade Education of Women.—The Cooper Union, New York, has a special department for women, in which are taught drawing, engraving, and photography; and in Boston and Philadelphia there are similar institutions.

To Correspondents.

Carbo.—We fear that advice is not of much avail in a case where you are so much hemmed in by conditions. Can you not build on the top of the house instead of in the garden? If you cannot, but must build in the garden, we do not see any plan but building up against the north wall a glass house of the lean-to form. Of course, with south aspect, you will have plenty of light, but the great disadvantages are, that a south light changes considerably with every passing cloud; and when the sun shines you must use some kind of thin blinds to break the direct sunlight shining on your sitter.

C. A. M. W.—The graphogenic apparatus has not come under public notice much lately, and we cannot tell whether it is used to any great extent at present, or not, as we have heard nothing of it. No alteration or improvement has been made in it, so far as we are aware; nor has it been superseded by any similar apparatus. We believe that, when used with neatness and skill, it answers well. Dry plate processes have been so far improved that their results may fairly vie with wet.

Prestwicke.—A panelled wooden background may be painted grey with advantage; panels, stiles, and moulding all of the same tint. The neutral chloride of gold of Mr. Sutton, of Norwich, is considered good.

Subscriber (J. H. W.).—The photographs you enclose have decided merit, both as photographs and as art studies The chief thing you have to guard against in the latter sense is crowding the subject with excess of distracting details, spreading the lights all over the picture, and producing "spottiness." The accessories in a picture should never be as prominent as the principal figure, either in lighting or definition.

A Colourist.—By an ordinary photograph we presume you mean a print on albumenized paper, and by separating the film you probably mean the coating of albumen. The possibility of removing the film of albumen bearing the image depends on a number of circumstances. As a rule, in the case of most prints, the film could not be thus removed with safety, because the albumen coating does not simply rest on the paper, but partly permeates it. Some time ago a paper was prepared in Berlin, the express purpose of which was to permit the removal of the film of albumen, and transfer it to any other surface which might be desired. To facilitate this process the paper was first treated with a coating of a soluble substance like starch, and then with the albumen, so that, after printing, &c., the film of starch was softened by soaking the print in warm water, the albumen film being easily lifted away. It sometimes happens that in a highly albumenized paper the albumen film is not perfectly coagulated right through its thickness by floating on the silver bath, the side in contact with the paper still remaining soluble; and in such case the film and print may, with care, be separated. To facilitate this, soaking in warm water to which a little of an alkali (say carbonate of soda) has been added will be found useful.

H. L. Saunders.—Full details of Mr. Burgess's Eburneum process are given in the Photographic News of September 4th, 1868. The number is in print. A condensed account appears in the Year-Book for 1869.

J. Ross.—Any time during the summer which may be convenient will suit as to time. For route, we can only refer you to Murray's or Baedeker's Guide-Book.

A. Noel.—We fear that you would find the image gone too, if you succeeded in dissolving the collodion, and a plain surface of wood left, as the chloride of silver on which the image is formed is absolutely in the collodion, forming an emulsion. It is only under special circumstances that collodio-chloride is available as an aid for printing on wood blocks. If a very powdery collodion be employed, and excess of nitrate of silver, an image is formed on the wood, as well as in the collodion; the film of such a collodion is generally more easy to dissolve, especially with a mixture of wood naphtha and ether. But, for this purpose, the uranized collodion and the Wothleytype process answer better, generally giving an image on the wood underneath the collodion. An image in printing ink, obtained from a chromo-gelatine film, answers best for engraving.

J. Ewing.—If you had sent us the prints on the cards upon which they were mounted, we could, probably, have told you absolutely the cause of the spots. As it is, we have little doubt in stating that some of them were mounted on cards the inscriptions on which were printed in bronze powder, or "gold," as it would be termed: the bronze powder contains a sulphide, and each spot is produced by a loose particle of the said powder, which is easily detached from the surface of the lettering.

N. K. Cherrill and W. Gillard.—Many thanks.

Received.—The "Medical Examiner," No. 4; "Photographische Jahrbuch," für 1876.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. Gibson, Scilly Isles,
    Photograph of the Bishop Lighthouse.
Mr. Leech, Macclesfield,
    Two Photographs of Mr. J. Cruttenden Lea.
Mr. F. Downer, Watford,
    Photograph of Painted Ceiling of Choir of St. Alban's Abbey.
Mr. Britton, Ilfracombe,
    Two Photographs of Sir Stafford Northcote.
Messrs. Tattersall and Rogers, Accrington,
    Photograph of Rev. Dr. Bailey.
    Three Photographs of Rev. W. Bunting.
Mr. J. S. Catford, Ilfracombe,
    Five Photographs of Sir Stafford Northcote.
    One Photograph of Sir Boucher Palk Wrag, Bart.
Messrs. Megson, Bradford,
    Photograph of Charles Dickens.
Mr. W. Mack, Coleraine,
    Two Photographs of Rev. R. J. Lynd.
Mr. J. Curtis, Plymouth,
    Photograph of Colonel John Elliott.
Mr. S. H. Fyfe, Glasgow,
    Photograph, from Painting, of the Steamers *Zealandia* and *Australia*.
Mr. G. Nesbitt, Bournemouth,
    Photograph entitled "She will Recover."
Mr. Richards, Barrow-in-Furness,
    Photograph of the Mayor and Corporation of Barrow-in-Furness.

The Photographic News, February 11, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Mechanical Action of Light.—This evening (Friday), at the Royal Institution, Albemarle Street, Piccadilly, Mr. William Crookes, F.R.S., whose name as an early photographic chemist is remembered, at any rate, by photographers of the old school, and who for several years held the appointment of secretary to the Photographic Society of London, is going to give an account of his most recent results in connection with his invenstigation into the radiation of light. Some time ago we gave an outline in these columns of what Mr. Crookes had done in the way of demonstrating that light was capable of exercising a perceptible mechanical action, and that gentleman's further researches are not less interesting. Our readers know that one of the first results obtained was, that when a pith ball is suspended from a thread in a vacuum, it is found to be repelled as soon as a beam of light is brought to bear upon it. This phenomenon Mr. Crookes availed himself of to construct a tiny weathercock, which spun round on a pivot, the four extremities being also provided with pith balls, one face of which was painted white, and the other black. When a lamp or a beam of sunlight falls upon this little instrument, the blackened halves of the pith balls are repelled, and thus the affair is made to revolve slowly or rapidly according to the energy of the light at the time being. This photometer—for it is nothing less—was all very well to prove that light possessed a mechanical action, but the inventor desired to do something more. He was not content with having proved the existence of a singular phenomenon which had before never been dreamt of, but desired further to make some useful application of the property of light which he had discovered. In this Mr. Crookes has apparently succeeded, for he employs his little "windmill," or "light-mill," rather, to register the energy of daylight during the twenty-four hours. As we have said, the tiny mill goes round the faster the brighter the light is that falls upon it, consequently the number of revolutions made by the instrument indicates the amount of sunshine or daylight that is being shed upon the instrument. In order to record the number of these revolutions, Mr. Crookes has recourse to an ingenious and simple plan. Underneath the little mill is suspended a small magnet, and this magnet is turned round by its action. Every time the mill makes a revolution, the magnet turns with it, presenting alternately its north and its south pole to another magnet suspended in juxtaposition. This second magnet, being delicately swung, is naturally much disturbed by such treatment, and consequently oscillates with some little energy every time one pole or the other comes round. This oscillation makes and breaks an electric circuit, and thus a signal is transmitted along a telegraph line every time a revolution of the little mill is completed. This signal, in connection with a Morse telegraph instrument, makes a dot upon a strip of paper, so that one has merely to count the dots at the end of an hour or day in order to find out how many turns the mill has made during that time. The greater the number of dots, the more energetic, of course, has been the light, for this has made the mill turn with greater celerity. An instrument of this kind will be particularly useful for meteorological records, for now we shall be able to register the amount of sunlight shed upon the earth with the same accuracy as we do the rainfall, and observe the temperature and magnetical disturbances of the earth. We congratulate Mr. Crookes heartily upon the success of his investigation, and upon the great assistance he has been thus enabled to render to the meteorological observer; for it can scarcely be doubted for a moment that the influence of light has most to do with our welfare upon this earth, and, therefore, it behoves us to learn all we can respecting it. To all photographers it must be exceedingly gratifying, moreover, to see one who many years ago laboured among them returning again to the study of light, and having his researches crowned with such success. As the French poet says very truly :—

> "On revient toujours
> A ses premiers amours."

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ENLARGING, AND ENLARGING PROCESSES.

BY GEORGE CROUGHTON.*

Some years ago I heard a good story of a certain retired grocer who lived in a semi-detached villa on the banks of the Thames. He had a crony who lived in the next villa—an old Indian officer—who, finding the grocer very simple, used to draw the "long bow" till there was great fear of the weapon snapping. Our grocer, once upon a time, went to hear of the truly wonderful travels and adventures of that pioneer of African civilization, David Livingstone. Need I say that he came back much disappointed, and with a firm conviction that David Livingstone's life and adventures were tame and insipid compared with those of his neighbour, Major Bang.

Now, in bringing the subject of "Enlarging and Enlarging Processes" before you this evening, I am afraid that, after the many wonderful stories told of enlarging processes, which are to convert photographers who are totally unacquainted with the use of pencil or brush into full-blown artists, chock-full of taste and experience, and of the wonderful productions which are to follow the use of certain formulæ, my remarks (like the life and adventures of David Livingstone to the worthy grocer) may be considered tame and insipid.

The advertised experience of certain photographers reminds me of the advertised cures by Dr. Blank's patent pills. Mr. A. had to keep an artist, at great expense to himself (Mr. A., not the artist), before purchasing Dr. Blank's patent pills. After swallowing the said pills he was enabled to do the work himself, and discharge the artist. Mr. B. was afflicted with a first-class printer, with an enormous salary; swallowed Dr. Blank's pills, and now he has better work done by a boy at six shillings per week, while the printer, poor fellow, is wandering about taking views, &c. Photographers must be very gullable if they can swallow that.

My aim, in this paper, is to place before you, in as plain a manner as possible, the results of my experience with the various methods of producing enlargements which I have tried, and the conclusion I have arrived at from that experience.

I will commence with the carbon process. I presume you are all more or less acquainted with the method of producing a transparency from the special tissue supplied by the Autotype Company. Those who are not should read an excellent article in the Year-Book of Photography for 1876, by Mr. Willis, which will give them all the information required. When the original negative is good, and the photographer is not an artist, and, therefore, cannot add to the result by a little judicious working, I would advise the use of this method before all others for simplicity and ease of working. It is the only method of contact printing by which the condition of perfect contact is fulfilled. My objections to the use of it are—first, that, in the course of my business experience, I have found that perfect negatives are the exception, not the rule; second, that in nine cases out of ten I can improve or alter upon the transparency where I could not upon small negatives or small transparencies; third, that the sensitized tissue will not keep; and, lastly, that sometimes the exposure is so long that I find it a great waste of time to wait till a carbon transparency is exposed enough, when I can get them so quickly in the camera.

I will next take the other methods of contact printing—

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* Read before the Edinburgh Photographic Society.

viz., by means of dry plates—the most successful of which was an albumen process, which was vended all over the country, and the results were, undoubtedly, very fine. This process can now be purchased for one shilling—either in Mr. Solomon's little work, "Photography in Four Lessons," or in the *British Journal Photographic Almanac*, where it is described by Mr. Foxlee. While admiring the really beautiful transparencies which can be produced by this process, I have still the same objections to it as to the Autotype process—that it produces small transparencies which it is impossible to work upon for improvement. Another objection is the great trouble involved in the preparation of the iodized albumen. The plates have to be coated with collodion, plunged into a bath of water, well washed, coated with the iodised albumen, and dried; then sensitized in an aceto-nitrate bath; washed again, and dried again. If you want dry plates for contact printing which will give as good results as the albumen plates, with much more certainty, and considerably less trouble, procure the Liverpool emulsion. Simply flow the emulsion over the plate, stand it to dry, or dry it at once before a dull, red fire, and you have a dry plate which will produce as perfect transparencies as need be. Of course there is still the danger of either the negative or the prepared plate breaking when put together for printing, and in my experience it is ten to one it is the negative. With Mr. Kennett's gelatine emulsion I have had very little experience, and that little was certainly not favourable to it.

I now come to the method by which the pictures before you were produced. In giving details I do not say dogmatically this is the best possible method of making enlargements. I show you certain results; I say I arrive at such results by such and such means. Another man may produce results by other means which may be better; but I say, most emphatically, that by no means whatever can any man produce good results without experience, careful study, and brains. Whatever process may be adopted, you may be sure that you will only succeed by sticking to the old school motto—"Try, try, try, again!"

I make my transparencies upon 8½×6½ plates, thus enlarging half way. Sometimes I make them the full size of the enlargement needed. Then the negative is either made by the autotype process, or upon paper, as described by Mr. Blanchard before the London Photographic Society; but the ordinary run of work is done upon whole plates, the old collodion and bath process—in other words, the wet process—being used. Before going further, let us take the objections urged against this method. The most important is that collodion, not being a structureless film, is unfit for enlarging from. Now, how does this objection stand in regard to the other processes which have been held superior to it for that reason? The autotype process commences with a substratum of collodion to develop the tissue upon. The albumen process does the same. Now, if the objection were valid, it would apply more to those processes, because the structure of the collodion would be enlarged from the quarter-plate transparency, instead of, as it is in my practice, from the whole plate. The fact is, there is no structure in good collodion if it be worked right. Of course, a sample which showed crapes or other markings would be as unsuitable for enlarging as it is for any other work. I am now making my own. You will find the full details in the Year-Book of Photography. You will find a mixture of equal parts of Mawson's and Huggon's collodion the best for the purpose. The method of using an enlarging camera is, of course, known to all. I use my dark room as a camera, a hole being made at one end, with a mirror outside to reflect through the negative. The first advantage I found in the use of an enlarged transparency is the ease with which it is focussed sharply. The exposure will, of course, vary with the light, density of the negative, &c., but always expose fully. It is the under-exposed, forced-up transparencies which give coarse texture. Develop with iron eight to ten grains per ounce, with the same quantity of acetic acid. Do not stop the development when the picture appears right, looking *at it*. It must be carried on until all details are fully out. When looked *through*, every part should be covered with deposit except the highest lights. I have forwarded one or two transparencies that you may see what I aimed at. When fully developed, wash well and fix, and strengthen at once, or you can let them dry and strengthen after; *in no case can this be omitted*. Take bichloride of mercury half-an-ounce, water twenty ounces. To one drachm of this put one ounce of water, and flow on and off the transparency till the blue tone it assumes at first is changed to a deep brown. Then wash off and allow it to dry, when it must be varnished, and when this is hard it is ready for the pencil.

I know there are many members of this society who have from the first consistently argued against the use of the pencil for retouching or "improving" negatives, and with good reason when it is made use of to the extent which is sometimes practised; but I must say that, no matter what process of enlargement be adopted, the pencil must be used at some stage of the process if the public are to buy pictures. Although a deal has been written about elevating public taste, I fail to see how that is to be done by offering photographs (enlarged or direct) which fail to do justice, by reason of the exaggerated defects due entirely to the fact of photography being unable to reproduce colours in their proper relation one to another, as seen by the human eyes. These defects are of necessity much exaggerated by enlargements, therefore some kind of working is absolutely necessary for the production of an enlarged picture which shall not be offensive, but truthful; but it must be done with knowledge and discretion. You will see by the transparencies before you that there is not much work done to them, but what is done is with the intention of adding to the gradations, and the deepening of certain parts which are required to give depth in the finished print.

Bear in mind that every touch put upon the transparency will appear upon the print in its proper shape as a dark touch—not reversed, as in a negative. In retouching, the parts which require looking to are: the pupils of the eyes, the line of the lash, the nostrils, the upper lip, and, perhaps, the hair and portions of the drapery may be deepened. Only light breaks or spots upon the face should be touched, and if some shadow should end too abruptly, its edge can be softened into the light, providing care be taken that the shape of the shadow is not altered. If this has been done with care, the transparency will be greatly improved, and can now be used for making the negative. If the transparency has been made the full size of the enlargement required, it can be used for the production of a paper negative, as described by Mr. Blanchard. A piece of ordinary sensitized albumenized paper is put in contact with it in a printing-frame, and a negative printed off, which should be fixed without toning. It can be waxed, which, in my experience, is better than using it without. Here is one of these paper negatives, from one of the transparencies you have seen, with a print made from it. It is slightly damaged by being doubled up, but it will enable you to judge of the effect of this method.

If the transparency has been made half the size, it must now be put in the place of the original negative, and a negative made from it in the usual way, by the wet process, the size required. Here I will mention one fact which I think a great advantage. If you have made your transparency by either of the methods of contact printing, you have to make your enlargement by one operation; and in exposing for a large negative made from a small transparency, I find the exposure at least three times as long as it is for the same size negative made from a transparency half way between the original negative and the enlargement required. This is a great consideration in dull weather.

Having made our enlarged negative, I come to the method of finishing it, which I do with some hesitation; for, in the warm discussion just closed, I feel I was placed in a very false position. I was treated as if I had robbed M. Lambert of *his* process, when the facts prove just the contrary. In the discussion the main fact was entirely overlooked, and various writers strained to show that M. Lambert's method of making the enlarged negatives was entirely different to mine. That I do not deny, nor does it touch the root of the matter at all. M. Lambert has not patented a method of enlargement. He has patented the use of semi-transparent paper upon both sides of the enlarged negative, and it does not matter by what process that enlarged negative may have been obtained. He claims to prevent any that are not licensees using the tracing-paper in the way mentioned. Now, fortunately for photographers, I have ample proof of priority of publication and use. In August, 1873, I made an enlargement of the late Emperor Napoleon III. for the Stereoscopic Company, which was finished upon tracing-paper strained upon both sides of the negative. This negative and others were seen in my studio by many photographers who came to me for lessons, and by many of my personal friends. Directly afterwards I sent three enlarged pictures to the Exhibition of the London Photographic Society, all three done by different methods, which I described in a letter to the judges. One of the three pictures—the head of a boy, 20×16—was produced by this method, and I have great pleasure in submitting it to you. The negative with the double covering was exhibited at a meeting of the South London Photographic Association, when I read my paper in December, 1873. It unfortunately got broken whilst carrying it home after the meeting, or I would have exhibited it also.

I have entered thus far into details to prove to you that, in spite of advertised threats to the contrary, every photographer is at liberty to use the method I am about to describe, although it is covered by a patent taken out in 1874; but, in doing so, I do not wish for one moment to depreciate M. Lambert's efforts as an instructor in various useful dodges. Anyone can learn more from seeing another person work who is well up in what he professes to teach than from pages of written description; but I must protest against the insinuations of unworthy motives so freely hurled against me, when the fact is, I have freely published everything I know which I have thought would be of use to my professional brethren—sometimes to my own loss commercially; and I could not stand by and see the method I had given to the profession coolly taken possession of, more especially as I was told that I should be prevented from using what I had myself devised. As that threat has not been carried out, I suppose they did not find the ground quite so safe as was expected.

I have here a 20×16 negative which will explain itself much better than I can in writing. The enlarged negative, not intensified, is varnished, and any transparent spots having been removed with a brush and water-colour (Payne's grey I find best for the purpose), is covered back and front with tracing-paper. This is done by slightly damping the tracing-paper, and running a thin edge of gum round the negative; when dry, it will be "tight as a drum." Now, upon the face side fill up any little breaks or inequalities with an "H.B." or "H." pencil, working upon the tracing-paper. In the hands of an artist, here is a great power for improvement. Observe upon the negative how the pencil has gone over lace, jewellery, &c., bringing up high lights and graduating shadow. Should any touch be too heavy, it can be softened with a touch of cotton-wool. Should broad masses of light be necessary, they can be put on with a tuft of cotton-wool and blacklead in powder, which has been mixed with an equal quantity of putty powder; but the masses of light are best put on on the reverse side. Great care is necessary not to cover up any of the delicate half-tones; but with care and knowledge a vast amount of improvement can be effected upon the reverse side, because, being the thickness of the glass from the sensitized paper, the working is softened. The danger to guard against is, that the decided lines and shadows are not softened *too* much. Any amount of local intensity can be given by the help of the mixture of blacklead and putty powder, while any false touches, or portions of the powder which may have gone over shadows, can easily be removed with a piece of bread or india-rubber. For instance, should a face print too quickly for the drapery, an even tint can be rubbed all over the paper, covering the face *upon the reverse side*, the high lights upon the forehead, nose, cheek-bone, and chin, strengthened with a "B.B." pencil, while if the face be flat and wanting in roundness, the powder can be removed with a piece of soft ink-eraser cut to a flat point. It is wonderful what a difference can be made by clearing off the powder from the eyebrows and eyes, the shadows under the nose and chin, and, if required, from the shaded side of the head, if the face should be very flat.

You will see by the negatives before you that I mask my background in the same manner, but I use soft pastel instead of blacklead. I take black and lake, and mix well with one-third its bulk of powdered pumice stone. This is rubbed on with the finger, and I have found nothing better for masking out any part of the picture that may require it; the edges are quite sharp enough, and yet they are soft. You will also see that I only resort to the double paper for negatives over 12×10; for that size and under I prefer to work with the pencil upon the varnish on the front or film side, while I mask out and work on the broad masses of light upon tracing-paper strained upon the reverse side. By comparing the enlarged transparencies with the negatives, you will see how little touching is needed upon the negative if the transparency has been mended properly. With larger work more touching is necessary; therefore, I use the double tracing paper as upon the 20×16 negative.

All the prints before you, except the 17×12 mezzotint, are untouched, including the 20×16 of the boy in a frame, which has only had the white spots stopped out. The others, you will see, have not had that done, as I wished you to see the results as they came from the negatives without after-manipulation, that you may judge for yourselves if there be any work wanted upon them, beyond simple spotting, to make them fit to be seen. The framed mezzotint is one of the two exhibited by me at the late exhibition of the London Photographic Society, which the *Morning Advertiser* classed next to the direct pictures of M. Hugo Theile, of Dresden, for softness and effective distribution of light and shade. This, coming from an independent daily paper, is a compliment of which I am not a little proud; for not long since it would have been rank heresy to mention enlargements in the same breath with direct pictures. It also shows what can be done by a process which has been condemned as old-fashioned and unsuitable for the production of first-class work. The results are before you, and the method by which they were produced I have endeavoured to describe so that anyone with average ability may succeed with it. It is not a process by which any ordinary photographer can be made to produce artistic pictures without himself possessing artistic knowledge; but it is like any other process, either in photography or out of it. Patience and skill will always succeed, and the best man will win.

NOTES FOR A SHORT TOUR IN BELGIUM WITH THE CAMERA.

BY JOHN LESSELS.*

In coming before you this evening, I must crave your indulgence for my shortcoming in not being able to impart any additional light on the varied technicalities of your beautiful art, as these are matters that you are all more conversant with than I, with my limited experience as an amateur worker, can possibly be. But I hope the few notes I have jotted down may afford some slight idea of what a rich field is open for the camera in Belgium.

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* Read before the Edinburgh Photographic Society.

In the first place, you have the quaint old houses, many of these picturesque in the highest degree, standing as they were three centuries ago; then their Town Halls and Palais de Justice, in the most florid style of Burgundian Gothic, such as you meet with nowhere else; their churches, which, although sometimes poor in outward appearance, and so crowded by other buildings as to be almost hidden from view, yet magnificent in their interiors from their lofty roofs and variety of outline, with their richly carved and decorated pulpits, marble screens, choice pictures, and other adornments, some of which it would take long days of anxious work to do justice to. Then there are their canals, teeming with fancifully coloured vessels, and their markets crowded in the mornings with the pesantry, in the quaint costume of bygone years, which they still rigidly adhere to, forming the most picturesque conceivable groups; and further, to the lovers of art, a rich feast in their picture-galleries, both public and private. And with all these inducements you may calculate upon meeting with a kind and hospitable people, and find you can live at a moderate cost; and the towns are so little distance apart, and of such easy access, that taking it all in all, I know of no other part of the Continent where you could find so much and so varied material of this particular class I have named, and all within a twenty-four hours' journey from Edinburgh.

You will observe I have said nothing of their landscape scenery, because much of the country in Belgium is very flat and tame until you go into the Luxembourg, where in the country around Namur, and on to Treves, you will find scenery that will compare even with our own beautiful land. I therefore propose to confine myself to a few of the towns only, as being quite sufficient for one summer's holiday; but it is likely when you have once seen these that you may in another year extend your journey by Liege and Aix-la-Chapelle to Cologne, and from thence into the North of Germany, where you will also find another wide field for your operations.

It is, however, a curious fact that rich as these parts are in subjects for the camera, there has been little done by the local photographers to illustrate them, and it is very difficult to get good prints at all worthy of the subjects.

Last August I met an artist from Brussels at work in Ghent, who told me that he was making a series of views of the churches, and promised to have some prints ready for me if I would call on him at Brussels; but he did not keep his word, and when I wrote to a friend afterwards to call for them, he found him gone. Besides the views of the churches, he had been selling some indecent prints, which brought the police down upon him, and he was obliged to make a hurried escape.

With these and the following preliminary remarks, I shall ask you to prepare to accompany me in our journey, and would suggest that along with your rapid rectilinear or doublet lenses, you also take a wide-angled rectilinear lens, as many of the most picturesque objects are in narrow streets and confined places, where the ordinary lenses would be of no service; also that your apparatus should be put up in small handy cases, and properly labelled, quite independent of your other luggage, and never allow these to go out of your own keeping, as the registered luggage (which it must all be on the Continent) often receives very rough usage.

If you intend to work with dry plates, have several thicknesses of orange-coloured calico between them and the lid of the plate-box, in case you should be asked by the Custom House officers to open it. I have never been required to do so, as I label my plate-box in prominent letters, "Cliché photographic; ne pas ouvert au jour;" and on exhibiting this, when accompanied by the tripod-stand and other requisite impedimenta, they are satisfied. Last, but not least, have your money in gold, or Bank of England notes, which are received through all Belgium.

Presuming, then, that you have everything in readiness, and time being always an object, my method is to leave by the limited mail at 5·55 p.m., reaching London about 4·30 in the morning; go direct to Charing Cross Hotel, where I can take two hours' rest on the sofa, wash, and have breakfast, by which time the office is open; register my heavy luggage, procure the morning papers, and secure my seat. At 7·40 the train leaves for Dover, and in two hours I am on board the Ostend steamer in Dover Harbour, looking out for a seat on the lee side of the vessel; and placing some of my traps there to show it is taken, I stow the rest in the saloon below, where I can find them easily afterwards, when ready to land.

In leaving the harbour, a magnificent view is got of the lofty chalk cliffs and castle, which I have no doubt must be familiar to you all, from Turner's well-known engraving. As this recedes from view, the vessels constantly passing up and down the Channel next engage your attention for a time, but, tiring of these, you seek relief in the perusal of the *Times* and other journals. So time passes on, and the sharp sea air makes one feel ready for a luncheon, which the steward, who is always ready for emergencies, provides.

A sharp look-out is kept to larboard for the Lightship, as we know from this that our voyage is half over; and now, the French coast being well in view, the time seems to pass more rapidly, the light-house tower on the quay at Ostend becomes nearer and nearer, and the vessel at last is running up alongside of the jetty at the entrance to the harbour; you will then see many an English face eagerly scanning the deck for expected friends, and saluting them, as they pass, with welcome gestures.

The boat being moored, the douaniers, with their chief in his gold laced cap, immediately come on board, when "Messieurs les voyageurs" are informed that the "baggage" for Belgium will be examined before leaving the vessel, and the registered luggage being laid out on deck, every one opens their own, which being examined, is left in the care of the officials. Your other luggage being examined in like manner, and chalked with a white cross, you are permitted to leave the vessel, and the train standing on the quay in readiness, you place your luggage on your seat in care of the conducteur, and as there will be nearly an hour to wait, you may cross the quay, and have dinner at the buffet, or take a stroll in the town, where there is very little interesting to be seen. At three o'clock the train leaves, and in about thirty minutes reaches Bruges, the far-famed Beffroi, with the spires of the churches, coming prominently in view; and as this will be our first resting place, we shall deliver up our receipts, and receive our registered luggage. In ten minutes more we are safely lodged in the comfortable old Hotel de Flandre.

Bruges is one of the most ancient and picturesque towns in Belgium, rich in historical traditions, and also in quaint architecture; and, having still some hours of daylight, the first thing to be done is to see as much of the town as possible, noting our subjects as we go along, and observing the aspects of each, so as to know what hour will be the most suitable for exposure. The magnificent Town Hall is among the first objects that arrest our attention, and, next, the interior of the Church of Notre Dame, with its beautiful carved oak pulpit, that is amongst the finest in Belgium; the tombs of Charles the Bold, Duke of Burgundy, and his daughter; the many fine paintings by Vandyke; and a marble statue of the Virgin and Child, said to be the work of Michael Angelo; and here, having found the verger, we must make arrangements for being permitted to work next day. This accomplished, we shall proceed on our walk round the town, admiring the varied views on the canal, and then return to the hotel, where, having unpacked what is necessary, and seen that the apparatus is all in working order, we settle upon our future proceedings, and, having supped, retire for the night.

After a good night's rest, and the fatigues of our journey overcome, we shall take advantage of the morning light to secure some of the quaint old houses previously noted, and, after breakfast, take the other subjects that are suitable until twelve o'clock, when service is over in the churches, and admission obtained to work. And now we must use all expedition, seeing that we must leave off again at four o'clock. With the most expeditious dry plates that I have tried, and a favourable light, I have not been able to get an interior with less than one and a quarter hour's exposure, working with a very large stop, so that the utmost a dry plate worker may expect to do will be to secure three negatives. I may mention here a trifling dodge which I have found of benefit, and that is, to have three plaques of rough wood, about three inches square and half-inch thick, on which to set the legs of the tripod stand; the rough surface of the wood prevents its sliding on the marble floor, and keeps steady the legs, which would otherwise slide. While the exposure is going on, we have ample time to examine the monuments, statuary, and pictures, and enjoy the changes of effect that are taking place with the change of light, parts of the walls at one time being tinged with the brightest vermilion, at others with changing colours of mauve and purple as the rays of the sun pass through the rich colouring of the windows.

By the second day we shall have done some good work, and, having paid a visit to the Hospital of St. John, and seen the beautiful pictures by Hans Memling, and taken a look at some of the other objects of interest, we shall leave for Ghent with the afternoon train, and, as the distance is only twenty-eight miles, the journey is accomplished in an hour.

(To be continued.)

CARBON PRINTING FOR SMALL WORK.

BY A. WELLESLEY TURNER.

It is evident that until carbon printing is more generally used for carte and cabinet work than it is at present, it will never take the position that silver printing now holds with photographers; the method, therefore, that I use for doing small permanent work may be of sufficient interest to your readers to find a place in your journal. The process has nothing particularly new in it, except the use of coagulated albumenized paper in the place of double transfer paper, which, as far as I can say, has not previously been used for the same purpose as I employ it. I also find the use of Mr. Johnson's last discovery (viz., the application of thin collodion to the carbon tissue) the greatest improvement, giving greater brilliancy to the prints, besides rendering the operation of developing much easier and more certain, so that I call special attention to this point.

The effect of the thin collodion is evidently to prevent the latent image on the surface of the carbon tissue from expanding too much before the paper and soluble gelatine behind have absorbed sufficient water to become limp enough for squeegeeing; the latent image being held at the sides of the paper causes the reticulation mentioned by Mr. Johnson, which in very bad cases ends in the film parting company with the temporary support; this, however, need never happen now with ordinary caution. The reticulation of the carbon image is not caused by any particular condition of the gelatine used in making the tissue, but by the temperature of the weather, which must materially affect an article like gelatine; but as the consideration of this point is not my object in now writing, I will pass over this subject, and give you my modus operandi of carbon printing as applied to carte and cabinet work.

The principal articles I use are the Autotype Company's special portrait tissue, Sawyer's flexible support, and coagulated albumenized paper. The special portrait tissue I sensitize in the ordinary way in a five per cent. bichromate bath, and hang it on laths to dry. If done in the evening, as a rule, the tissue is dry by the next morning: I then coat the tissue as evenly as possible with a thin collodion, as described by Mr. Johnson a few weeks back (I prefer to do it before printing, as I can then coat larger sheets at a time), and afterwards cut it up into smaller pieces as required; but in doing so care must be taken that the collodion is perfectly dry before putting in the printing-frame, as it would otherwise adhere to the varnish of the negative.

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After exposure, I take the prints with the same number of pieces of Sawyer's flexible support and commence the development; the whole of the flexible support (say forty or fifty pieces) first separately wetted, and then put at the far end of a large zinc dish of cold water. Having the printed tissue in a convenient place, I take one piece, and after putting it in the water, draw over one of the pieces of flexible support, and when the tissue begins to straighten, and become limp, I take them both out together, and squeegee them in the ordinary manner. Each print is then hung up by a clip, the same way all the rest of the prints are done. After hanging for about ten minutes or more, the prints are placed in the dish of warm water, the tissue stripped from the support, and then turned face side down to develop of themselves; this will be done in a few minutes, but they can be left much longer—in fact, I always leave them in the warm water whilst I am squeegeeing another batch of the prints, which are ready to go into the warm water by the time the first are thoroughly developed. By this means a large quantity of small prints could be got through. They are, when properly developed, well rinsed in clean cold water, put in alum for about fifteen minutes, and again rinsed, and hung up to dry; this must be done spontaneously, as heat, of course, will cause them to peel off from the waxed support.

The flexible support can be used repeatedly, and, in fact, is in every respect a most useful article, and I prefer it much to collodionised glass. When the prints are dry, I take some good albumenized paper that has been previously coagulated by soaking for about ten minutes in common methylated spirits; this I cut into suitable pieces, and place them with the prints into a dish of clean cold water; when they are both perfectly limp I take them out and squeegee them together slightly in the same way as when applying ordinary double transfer paper. It is now again dried, when it will easily peel off from the flexible support. From this stage the prints can be handled and treated the same as silver prints.

The reason that I use coagulated albumenized paper is that it has such a fine texture, and gives very brilliant and delicate prints. It is easily prepared, and, in my opinion, works more uniformly and with greater certainty than the ordinary double transfer paper. I should certainly advise every photographer who is thinking of going in for carbon printing for small work, to give it a trial, and I am quite certain they will find that the difficulties which many imagine carbon printing is endowed with are not so dreadful as they appear at a distance.

Tinning Wire.—A thin film of tin may be applied to iron wire, to give the same the appearance of silver. The wire is first placed in hydrochloric acid, in which is suspended a piece of zinc. It is afterwards placed in contact with a strip of zinc in a bath of tartaric acid 2 parts dissolved in water 100 parts, to which are added tin salt 3 parts, and soda 3 parts. The wire should remain for two hours in this bath, and then be polished.

The Photographic News.

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ANNUAL MEETING OF THE PHOTOGRAPHIC SOCIETY.

The Annual Meeting of the Photographic Society, held on Tuesday, gave some promise of a new era for the Society. To those of optimist tendencies, at least, all seemed rose-coloured and charming. The members met in a new room, handsomely decorated and arranged, with abundance of light, and a fine array of water-colour drawings on the walls, the council and various officers before their crimson covered tables, all admirably arranged and as imposing as a senate scene on the stage. The treasurer's report was singularly satisfactory, and with a balance of upwards of four hundred pounds in hand the council might well feel jubilant on meeting the members. The references to the exhibition, which was minutely analyzed in the council's report, and the figures given by the treasurer, were also satisfactory; although it was scarcely accurately stated as yielding a profit, inasmuch as the cost of the introductory *conversazione*, which has always been looked upon as an inevitable part of the expenses of the exhibiton, would bring up the costs to upwards of one hundred and forty-seven pounds, against one hundred and thirty-seven income, showing a balance of ten pounds on the wrong side. Nevertheless, we think that everyone will agree that the money expended on an annual exhibition is well expended. The excellent remarks of the chairman on the aims and prospects of the exhibition indicated his feeling that, having entered upon new premises, it was a good opportunity for forgetting old differences and making a new start. It is true he also, in referring to the necessity for revising the revised rules, expressed a conviction that the mode of nominating and electing officers must be brought into conformity with the usages of other learned societies, reviving the wise system of a house-list, which was the bone of contention two or three years ago; but as a vote of thanks to the chairman for his services was enthusiastically proposed by the leader of the opposition at the time, no serious antagonism seems imminent in the matter; and the hatchet appears fairly buried.

A momentary chance of discord arose when Mr. Hooper rose to criticise the report of the council, the adoption of which he had moved. This report of the council had deplored a lack of scientific qualities in the papers, which were too much devoted to merely manipulatory matters. Mr. Hooper endorsed this, and went further, pointing out a number of important scientific questions connected with photography, now before the public, which had never been before the Society. This tone was unpalatable, it seems, to some, and a voice, apparently from a member of council, appealed to the chairman, asking whether the members did not come for something more pleasant than Mr. Hooper's "windy" remarks. The chairman was judiciously deaf to this appeal, and Mr. Hooper concluded by pointing out that a perfectly appointed room, and a good balance in the hands of the treasurer, would be insufficient to secure the advancement of the Society unless a change were made in the scientific pabulum supplied to members. Many of Mr. Hooper's remarks were doubtless well worthy of careful consideration, and it was a pity that by a personal reference to the treatment he himself received, on reading a paper twelve months ago, he should have drawn the cautionary request from the chair to avoid personalities. The chairman's response to his remarks was judicious, if not quite sufficiently logical. He pointed out that, by Mr. Hooper's own admission, the council had secured papers by inviting members to read them. But Mr. Hooper's objection was to the quality of the papers, not to the inactivity of the council. The response as to the difficulty, if not impossibility, of getting such papers as Mr. Crookes and Mr. Tyndall read before the Royal Society is, we fear, beyond question true; and the suggestion that Mr. Hooper should himself try to obtain some of the gentlemen to whom he had alluded to read papers was at least adroit and practical. One of the firmest of chairmen, Mr. Glaisher also knows when to be conciliatory, and to his assiduous efforts the Society owes much of the prospect of restored harmony. Without being invidious in praising individuals, we cannot touch upon a subject like this without referring to the invaluable adjutor the Society has secured in its present treasurer, whose all-pervading activity in his own and other executive duties is beyond all praise.

The year opened well as regards papers, with the very able and interesting paper of Herr Warnerke, on the advantages of gelatine pyroxyline, and the general question of the organic combinations with silver in various emulsions, a subject which will be discussed at the next meeting. The officers elected were Mr. Glaisher for president, Professor Stokes as vice-president, and Captain Abney, Mr. Wharton Simpson, Lord Lindsay, Dr. Diamond, Col. Stuart Wortley, and Mr. W. Bedford as members of council.

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THE SURFACE OF CARBON PRINTS.

Every photographer of taste is familiar with the fact that much of the artistic value of a photograph depends upon the surface texture of the print. Independent of all other elements of photographic and pictorial excellence, there is a sentiment in the mere quality of the surface which materially affects the amount of pleasure the picture can confer. A strong repugnance exists amidst many to the glazed or "enamelled" surface obtained by producing a print upon a film of collodion, which is suffered to dry in contact with plate-glass, and so acquire its surface. For small prints, where all the advantage of delicate rendering of detail is desirable, this enamelled surface is, probably, by no means illegitimate, but for large prints it is generally offensive; partly because a glittering reflecting surface is undesirable in a large picture, and partly because, both inherently and by association, such a surface has a common, vulgar effect. Another surface which we have seen on some carbon prints, mounted on one of the forms of regulation transfer paper, has a semi-glazed surface of a somewhat horny or leathery texture, which certainly detracts from the artistic value of a good picture.

This question of surface texture is one which is certainly worthy of attention. Some of the early carbon prints produced by Mr. Swan were charming in this respect. The surface generally was free from gloss, the pure whites possessing a perfectly matt texture, the deepest shadows only showing a distinct glaze, giving them richness and depth, and contrasting pleasantly with the pure matt surface of the whites. An example we received a short time ago from Captain Waterhouse was charming in texture, the paper used for the final transfer being the paper used in fine lithographic and collographic printing, having an enamelled surface, of lime we believe; but instead of being glazed, as enamelled papers usually are, this is perfectly matt or dead, like the surface of marble when "smoothed," but not polished. We have been favoured this week with some samples by Mr. Wellesley Turner, of Dublin, in which the final transfer paper is albumenized paper with the surface coagulated. The result is very satisfactory. In the process of coagulation the surface, which is not too highly albumenized, seems to lose something of its glitter, acquiring a very fine and very smooth texture, with a slight approximation to a grain. The effect is very similar, but in some respects better than that of an ordinary albumenized print, from which it would not at first sight be distinguished. We are indebted, also, to the courtesy of Mr. Turner for a detailed statement of his operations in applying carbon to the production of small portrait work, such as card and cabinet sizes, a branch very important, and requiring the greatest care to secure the highest success. We commend the communication of Mr. Turner to our readers.

ON SOME FAILURES.

BY WILLIAM BALL.*

In commencing business one is apt to be very careful in laying out his money, and fair excuse is allowed if he tries to get good articles at the lowest price. In my case I purchased a card lens which was then extensively advertised, and claimed to be inferior to none of our best makers. I had the good fortune of a gentleman of experience to select one for me. I obtained very respectable pictures with it—in fact, was often complimented for the good work it produced, a professional friend purchasing one from seeing the results of mine.

Well, for two years everything went as merry as the wedding bells, when my pictures gradually showed a kind of fogginess—a sort of out-of-focus look—which puzzled me exceedingly. Thinking my camera had by use got a little wrong, I tested to see if the focussing-screen and plate in the dark slide were at equal distance from the lens. There was nothing wrong there—distances exactly equal; but the fuzziness continued—so much so that I wrote to the lens maker describing it; but he indignantly denied the possibility of fault in the lens. Now for the most extraordinary part of my story, which, if any one doubt, I shall be most happy to give reference. This fuzziness had become so bad, especially in groups, that I found I was losing caste; so I packed up lens and camera, travelled up to a professional friend in town, and asked him to set me right. I showed him the negatives I had been doing, so different to what I had done previously. We went into his studio, tried a plate, and to my amazement—in fact, I may say, chagrin—the result was a negative as good as a negative could be desired. Tried another, and another—all right. Where, in the name of common sense, could the fault lie? He tried to get at my trouble, asking every imaginable question, as to mixing of chemicals, disposing of blinds, screening of lens during exposure, &c., but failed to elicit the slightest trace of a cause, or relief to my dilemma. Finally, he suggested that I should purchase a new camera. As my old one was not quite so rigid as it ought to be, I gave the necessary order for one, and returned. On arrival I rushed into my studio to try a plate—I could scarcely restrain impatience to clear it, so eager was I to see the result. When it came, how shall I describe my surprise to find it all right—clear and as brilliant as possible! I thought I could detect the slightest trace of the old enemy, but nothing of any consequence. But where was the fault? I was as anxious now to find out the cause as I had been to remove it. My own impression was that my lens, after its ride by rail, had been, like a naughty child, cured by a good shaking; but it seemed too ridiculous a theory to give to my professional friends, so matters went on for another month or two, when, to my amazement, the old enemy appeared again. I tried all things imaginable to find out. No use—my new camera gave no better results. I had some groups to do: they were so bad that after their departure I was meditating which should be thrown into the fire first—the lens, camera, or chemicals—when an amateur dropped in for some absurd information which was easily given. Remembering the fable of the lion and the mouse, I showed him my negatives, and asked if he could account for it. "Easily," he remarked. He had a French lens, purchased of a travelling artist, the tube of which was marked to a scale; after the image was focussed, the tube was moved to the next mark, so as to bring it nearer the plate. This was the first time I had ever heard of such a thing; it was quite new to me. The visual focus was not the actual focus. I wrote to a friend to bring over his lens to test side by side. I placed one on the top of the other. His yielded good negatives, while mine were fuzzy. On a table I arranged a row of objects in a line with my camera, but just at an angle to focus the centre. The result was, all were out of focus excepting the one at the extreme end, and yet focussing-screen and plate coincided in distance. Up to town again I went—to the lens maker this time. He pronounced it strange, but said shortening the tube would remedy the evil. This was tried, but proved of no use; so he removed the difficulty by giving me a new lens, which I have worked ever since.

With this failure came another annoyance. In mentioning this to any of my professional friends, they are dubious, shake their heads, and manifestly doubt the statement. An Irish friend of mine, more candid than the rest, told me plainly, "It's no use, my boy; you can't make me believe a lens, being in the first healthy, should turn sick, get well again, then grow worse." However, these are the facts. I can give reference to five professionals who can vouch for it. But I had this lesson taught me with this failure: that it was not important to get a painfully sharp negative to secure a good picture. A proper diffusion of focus gives softness, which sharpness does not yield.

One more troublesome failure, and I have done: this was my negatives, after a month's age, peeling off—not a cracking of the film, but a gradual decomposition, which set in, finally shelling off, leaving the bare glass. This occurring just after removing to other business premises, I at the time attributed to a change of the washing waters, the new one being very hard, full of chlorides. I thought they did not agree with the cyanide fixing, so I adopted hyposulphite, and yet, with this, after a time, coarse shelling set in. I had no reason to doubt the varnish; for years I had used a white hard, diluted with spirit, without the slightest sign of cracking or shelling; and this trouble, coming so directly after my change of premises, quite threw me off my guard. But as the shelling continued after all my different experiments, I had to turn to the varnish, and changed it for another sample, not without hesitation. I did not like to discard an old friend whom I had stuck to for the past ten years, but, fortunately, I did so, as that proved the enemy. I consulted a chemist, who gave his opinion that the manufacturer had changed, or was not so careful as he used to be—the probability being that the resin used contained moisture, although not showing when the negative was varnished. As my store-room was a very airy one, certain evaporation would take place, and the varnish would reduce accordingly. Whether he was right or wrong, I cannot say; but it was a serious loss to me, and shows the importance of manufacturers supplying us with good materials, as we are greatly depending upon them for our best results.

In conclusion, I trust the reader will not think I have magnified these failures. I have freely given them. Since the establishment of the Year-Book* I have looked upon its aim to be for the advancement of photography, and I think all its readers must confess—no matter how experienced they may be—that they learn something from its humblest contributor. So I add my mite in the hope that, although the remedies of these failures might have been simple to many, yet somebody may be the wiser for their open avowal.

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* Continued from page 57.

* This paper was intended by Mr. Ball for our Year-Book, but arrived too late.

Correspondence.

COST OF CARBON PRINTING.

Sir,—In his letter in your last Mr. Bovey, with the intention of damaging the cause of carbon printing, has adduced in its *dis*favour a quality which, with the exception of beauty, all those who care for the prosperity of photography will look upon as the very highest virtue a photographic process can possess—it is costly! The two things that have done more than any other to damage our art have been the ease and cheapness with which results (of a sort) could be produced. This facility and cheapness induced too many (as has often been pointed out) who were intended by nature for some handicraft—honest or otherwise—but too idle to work, to pick up a precarious living by acting as camp followers to an art to attain the highest perfection in which requires talent, if not genius. Thus photography, "mated to a clown," has been levelled down until the status of photographers—about which we talk so much—has became a byeword. A few have been able to pull themselves above the level by the highest quality—beauty of result; they have now an additional safeguard—cost; it will no longer be possible to sell cartes at 6s. per dozen, except in silver. It is therefore clearly the duty of all photographers who care for their art to push forward a process which, when thoroughly appreciated by the public, will make fading silver pictures unsaleable, and it must necessarily follow that cheap and nasty photographers will become extinct. A beautiful thing will pay for its cost, no matter the price. An ugly thing is better left to rot and fade. But *malgre* carbon, there is no reason in the world why Mr. Bovey, and those whose cause he advocates—the cheap photographers—should not go on printing in silver to all eternity. A Carbonist.

Dear Sir,—Mr. Bovey's very seasonable letter will be a great relief to many who are perplexed about the present and the future of photography. There can be no doubt that to produce cartes at ten shillings and cabinets at one pound per dozen is out of the question, and I am afraid that this low figure will be found a fair average price throughout the profession. For this description of photograph, charged at so much per dozen, I do not think the general public will appreciate the advantages of carbon, or pay an advance for what, in appearance, is the inferior article. All other sizes, plain or coloured, should be in pigment, and, judging from my own experience, when they are recommended, the advance in charge is readily met.

I should like to see the matter placed before the profession in a business-like form. For instance, how long will it take a good carbon printer at a salary of two pounds per week, and a boy at ten shillings, to produce one thousand cartes and one thousand cabinets, and what would be the cost of the material? An answer to this will enable us to get at a comparative cost with silver printing. I hope our esteemed friend Mr. Hughes will give us the benefit of his experience.—Yours faithfully,

80, *West Street, Brighton.* W. Hall.

Dear Sir,—The relative cost of carbon and silver printing will not in the slightest degree affect its introduction. If carbon prints had been proved beyond a doubt to be permanent, they would be worth all the extra trouble and expense of production. It would be easier to charge a higher price for it where low prices are given now, and issue silver prints at the present prices, and let the public choose for themselves. The question will turn on the point so gently touched by "An Old Photographer" in last week's News, where he says, "Conceive the humiliation of a permanent print fading." Now, as it was owing to their instability that I did not introduce it nearly three years ago for all my work, perhaps my experiences may not be very uninteresting to your readers.

I made arrangements for the production of my enlargements in carbon from my own negatives, and exhibited specimens in my window in both carbon and silver, and advertised the carbon prints in the local papers as unfading The public I found rather shy of the carbon, preferring the silver prints, for their greater beauty. Months passed, and looking over my specimens on view in the window, I was surprised to find the white of a 12 by 10 vignette print was become of the colour of a faded silver print. I immediately took it out of its frame and mat, and found that the portion of the print exposed to the light within the oval mat had not faded, but printed of a dirty yellow colour; while the portion protected by the mat preserved its whiteness.

I fancy this was caused by the bichromate left in the print, printing in the strong light of the window. It militates sadly against the appearance of the pictures. I have since seen, somewhere in London, a carbon picture of a similar sere and yellow colour. Another picture was printed in sepia. This was an unmistakable case of fading; the tinted ground has also become darker. It is in a far worse state than the other. I have these prints now, and shall be happy to show them to anyone who will take the trouble to give me a call at Luton, should they be in the neighbourhood.

In my own printing in carbon by double transfer, I found great difficulty in printing, or rather developing, and transferring vignettes; also a peculiar grain that, scarcely perceptible in large prints, could not be passed in C.D.V.'s. In regard to the relative beauty of carbon and silver prints, the palm must unquestionably be given to silver. I have yet to see a print by any other process that can compare with a good silver print. Experiences like these

> ——puzzle the will,
> And make us rather bear those ills we have,
> Than fly to others that we know not of.
> * * * * *
> And enterprises of great pith and moment,
> With this regard, their currents turn awry,
> And lose the name of action.

Yours truly, Henry Gregson.

Dear Sir,—Your correspondent Mr. Bovey remarks in your last issue that every disputed question has two sides, and that when only one side is presented to view, the other is likely to be misjudged, &c. I quite agree with him, yet I consider he takes a decidedly one-sided view of the matter he is discussing. His arguments are too weak, and really the whole strain of his letter is very depressing. He tries to condemn carbon printing, for the reason that it is more expensive to work than silver printing; but I think in the course of a few years the process will be as simple, if not as cheap, as the old method.

Perhaps Mr. Bovey has not seen specimens of carbon printing by Mons. Lambert's process. My experience of that process (now extending over some months) enables me to state that I have seen results far superior to anything I have ever seen in silver printing. I see the process in daily practice, and it can be worked by any printer of ordinary intelligence.

In carbon printing I see a friend to photographers. Let those whose present prices will not allow them to print all their work in carbon, use the process as a "speciality," and charge more for pictures so produced, and I am sure the public will support them. That much-abused body are getting more day by day to know what good pictures are, and if the photographer can guarantee permanency, they will gladly pay a higher price for their pictures, for they look with sorrow upon the yellow and spotted pieces of cardboard in their albums which once were brilliant photographs.

Mr. Bovey says the art, or whatever we like to call it, is in a very precarious position. Now is the very time to drag it from that position, and I must tell photographers that bemoaning the badness of trade will not improve the same; there is only one way to do so, and that is by hard work, and very hard work too, for excellence.

Of course I am aware that there are some so-called photographers, whether they print their work in carbon or silver, will never succeed to make more than both ends meet. Happily their days are numbered; for the time has gone by when dirty fingers, and an elaborate smoking cap with a very long tassel, were considered nearly all that was necessary to make a photographer. Such men I would advise to return at once to their former vocations; for if they do not they will find their present occupations, like Othello's, irretrievably gone.

Mr. Bovey complains that the gentlemen who have taken upon themselves to recommend carbon printing to photographers have omitted to back their opinions with real names; but if Mr. Bovey will take a few back numbers of the News, he will find in Mons. Lambert's advertisement several names of gentlemen who have purchased his process and sent him testimonials. Mr. Hughes—the honourable exception, according to Mr. Bovey—testifies as to the practicability of Mons. Lambert's process. He alone is a host in himself, and such a man is an honourable example to us all. Mr. Bovey also tells us that Mr. Hughes has tried many new things, and, after a fair trial, has returned to the old. Great credit is due to him (Mr. Hughes) for his enterprise and perseverance, and I have no doubt his last venture from the well-beaten track will amply repay him. Nothing venture, nothing win.

Mr. Bovey's remarks concerning the cruelty of drawing the photographer into expending his money to purchase a process that will inevitably disappoint in the end is simply nonsense. Does he use the adverb "inevitably" advisedly? If so, I should like to know whether he has tried Mons. Lambert's process. If not, I decline to believe in Mr. Bovey as an authority.

I quite agree with Mr. Bovey when he suggests that it might be said he had personal interest in view. I have no desire of being the champion of the Autotype Company, as I have no doubt they can defend themselves without my humble aid, if there was any occasion for them to do so; but I really do not think any rational person believes for a moment that their only interest is the improvement in carbon printing—in fact, they state honestly that they have something superior to offer photographers, and expect some return for their outlay.

Apologizing for trespassing so long upon your valuable space, I am, sir, yours truly, James Owen.

SULPHURIC ACID IN EMULSIONS.—URANIUM IN THE NITRATE BATH.

Sir,—I think I may safely say, in answer to the "Old Photographer," that under the circumstances mentioned by him, nitric acid will be displaced from its combination with silver on formation of the sulphate.

In regard to uranium in the silver bath, there is no particular formula advisable beyond what I said in my paper read before the society—viz., a heavily bromised collodion, and from six to ten grains of nitrate of uranium added to the bath. But Mr. Werge's curious mistake must be certainly avoided; the uranium must be purified, and *not* the commercial salt added, as Mr. Werge did, direct to the bath. If so added, failure must result; but if treated as I recommend, a great increase of sensitiveness is the result.—Yours, &c., H. Stuart Wortley.

INCREASING ILLUMINATION.

Sir,—In one of the paragraphs in "In and Out of the Studio," of the 28th ult., was an article on "How to Obtain Increased Illumination," describing Dr. Tyndall's experiments, showing that air containing floating particles was more luminous than purer air; the writer towards the end remarking, "Whether the photographer will ever make use of this method of increasing the light in his studio is a matter which has yet to be determined." Not so, for besides, as the writer naively adds, "He would not desire, probably, to fill his studio with Bacteria and the noisome smells that accompany their development." Of course he would not; and if he did so, the increase of light in question would be of no use to him, but would be a positive harm. Indeed the idea of using such a means of illumination is quite a fallacy, as by using such light we should photograph not the object we wish to depict, but the myriads of minute particles so placed in front of the camera. And if we attempt to use them as reflecting surfaces we should find the light transmitted from them to be immeasurably less than what can be got from objects of a more compact nature, and more easily to be managed. So that we need not entertain the idea for a moment that receptacles filled with dirty air will ever take the place of frames covered with white calico, or similar material. Anyone who has photographed an interior on a sunny day must have noticed the beams of light which come through the windows on the illuminated side; and if any such beams are included in the field of his view they will be distinctly rendered as lines much lighter than the objects they cross, but very materially weakening the image of whatever may be behind them. The oblique lines thus formed may frequently be of much service in balancing the rectangular lines—say of a church interior—and in that manner may add charm to what otherwise might be a formal, ungraceful picture. But if it is attempted to introduce such beams of light into a portrait studio it must result in a most complete failure. I have constant experience of this from the fact that I had no choice but to build my studio with its windows facing west, so that the sun shines into the room from the commencement of the working day to sunset. When the place was first built I frequently tried (particularly in the case of children) to work without blinds; but such attempts always resulted in a hazy picture; in fact, a picture of the beam of light traversing the room—or rather, I should say, a picture of the minute objects floating before me. A little experience soon showed me that by a careful use of blinds, though the object to be photographed looked darker, yet I got a brighter picture of it, without in any way increasing the time required. This could not have resulted from my having removed the floating particles, but from the fact that they ceased to send off any light which would impress itself on the sensitive surface, and that only the rays from the sitter could enter the camera in sufficient force to make an impression.

In writing the above I beg to disclaim any intention of being severe on the writer of the article in question, as I always read his articles with much pleasure; but simply to prevent anyone being misled by confounding the notion of an illuminated atmosphere with a means of illumination.—Yours truly, J. Walter.

Lyme Regis, February 5th.

INDIA-RUBBER LINED BATHS.

Sir,—Mr. Viles, in his paper read before the Photographic Society (see Photographic News, December 24th) mentions the use of a wooden dipping bath, lined with fine sheet india-rubber. I should feel greatly obliged if Mr. Viles would inform myself and others where such baths may be obtained, and where to procure the sheet rubber for the purpose.—I am, yours truly, Bromo.

[The baths in question used many years ago to be made and sold by Mr. Francis, of Great Russell Street, near the British Museum. By whom they are manufactured now possibly Mr. Viles will kindly let us know. The sheet india-rubber can be obtained at most india-rubber warehouses.—Ed.]

BLISTERS.

Sir,—On reading the article of Mr. F. M. Spencer on "Blisters" in your last number, being almost the same as I have read previously by others, I beg to inform my fellow-workers that for many years I have adopted a very simple mode, so as never to meet those ugly spots; and everybody knows that hyposulphite of soda, when dissolved in 1 to 8 or 1 to 10, is always cooler than the water. I did not try to wash them in spring water, neither do I wash them in salt, for you get rid of the hypo; but everybody will find that it is a difficult job to get rid of the salt, and not every photographer has the convenience to nurse them all night; nor did I try any other way to make the water cooler still. On the contrary, instead of making the water cooler, I make the hypo warmer by putting a little boiling water to make it slightly lukewarm; or prepare the hypo solution a few hours before using, and keep it near a fire-place.

I will guarantee that if anyone would like to try it, they never would feel sorry for it; and as, often and often, bubbles are a great trouble to many printers, I hope, by using the above-mentioned method, they will be convinced of the reality.—Yours respectfully, Gustavo.

SYPHONS FOR EMPTYING SILVER BATHS.

Dear Sir,—I think I can improve on Mr. Wane's syphon as represented in the News of February 4th, for the purpose of emptying silver baths, &c. Mine is a 12×10 bath. My syphon is, I believe, from what he says, cheaper, simpler, more portable, less liable to be broken, more easily managed, and easier to make.

I found at Mr. Solomon's, Red Lion Square, some little pure india-rubber syphons, which cost, I think, 1s. 6d. each: but they were not long enough for my purpose, so I went to the nearest glass shop, and bought a few short lengths of glass tubing, just the size to fit tightly into the india-rubber tubing. In the original syphon, a little way from one end, is a small india-rubber ball. The glass tube is attached to the longer end of the original syphon, and can reach to the bottom of the bath. I drew the india-rubber tube one inch or so over the glass tube.

After insertion into the bath or bottle, the india-rubber tube bending over the top of the vessel, I squeeze the air out of the little ball, pinch the short tube below it, let the ball go, then the tube, and the syphon acts beautifully. The whole thing can be made and set to work in three or four minutes; and I have got some now which have been in use for a very long time. When travelling I put the bath syphon (or others, separately) into a cardboard sheath with a cap, such as is used for long thermometers, &c., and it takes up a minimum of space in the tent, without danger of fracture.

I had a very much larger one made specially for me, on the same principle, by Messrs. Cow and Co., of Cheapside, for the purpose of drawing off the waste fluid out of the cask into which I run my washings after precipitation of the silver.

Once started, I leave them to themselves, and return to find the work done. The whole of the larger one is made of india-rubber (not vulcanized), no glass tube. I forget the cost of it, but it was not great, perhaps, 3s., 4s, or 5s.; and the glass tube for the bath would, probably, be about 2d., making the smaller, suitable for baths or bottles, come to about 1s. 8d., or 1s. 9d. at most. Of course these syphons can be made of any size.

When not travelling, the little syphons hang on hooks in my studio, and are ready for use at a moment's notice; and I find them good for many purposes. I always keep separate ones for bath, developer, &c., and label them. This avoids nearly all need of filtering, as when there is any deposit I take care not to allow the syphon to go near it, if necessary tying it up with a bit of string.

If this trifle be of any use, pray utilize it.—Yours very faithfully, T. J. A. Parkyns.

Harnham Cliff, Salisbury, Feb. 7th.

PS.—Be careful to let the end of the tube you have hold of be within the receptacle, into which the bath, &c., is to be decanted before you let go, for if the little ball be fully expanded, which it should be, the syphon acts instantly, and you may make a mess. I never lose a drop.—T. J. A. P.

Proceedings of Societies.

Photographic Society of Great Britain.

The annual meeting of this Society was held on the evening of February the 8th, in the Old Water Colour Gallery, 5, Pall Mall East, Mr J. Glaisher, F.R.S., in the chair. The minutes of a former meeting were read and confirmed.

The Chairman announced that Mons. Davanne and Mons. Romalieur had been made honorary members of the Society.

The following new members were duly ballotted for and elected:—Lieut.-Col Bagot, Mrs. P. P. Bailey, Mr. W. B. Clifton, and Mr. J. T. Taylor.

The Chairman, in congratulating the members on the comfort and convenience of their new meeting room, entered somewhat largely into the purpose and aims of the Photographic Society, and the course it should take in the future, referring to the necessity of revising the recently made rules, especially in relation to the nominations and election of officers, and bringing the laws more in this respect into conformity with the usage of other scientific societies.

The Honorary Secretary (Mr. Friswell) read the report of the Council, and was followed by

The Treasurer (Mr. Thomas) who read the financial statement, which indicated a prosperous state of the funds, showing a balance of £400, of which £279 was in the banker's hands. The costs of the exhibition were in round numbers £132, and of the soirees held in connection with it £30, the income from the exhibition £137. Mr. Thomas congratulated the Society on the result, and on the improved prospects of the Society, and briefly hinted an intention on the part of the council to open the gates wider to country members.

The Chairman asked for a special vote of thanks to the treasurer, to whom they were largely indebted for exertion in securing many of the improvements, and for the satisfactory financial condition.

The meeting thanked Mr. Thomas by acclamation, who acknowledged the compliment.

The Honorary Secretary then read memoirs of Sir Charles Wheatstone and Mr. C. B. Vignoles.

After a correction in a matter of detail in the memoir of Sir Charles Wheatstone,

Mr. Hooper moved the adoption of the report, which was seconded by Mr. Spiller, and Mr. Hooper proceeded to make some comments thereon. Agreeing with it in some points, he regretted many things. In regard to the exhibition, whilst it was crowded with enlargements, not less than 113 having been exhibited, he regretted that there were scarcely any examples of direct large pictures, which were much finer in result: witness such specimens as the noble landscapes Mr. Earl used to send, or the fine pictures produced twenty years ago by Bisson Freres. Regarding the papers read, there was a sad lack of novelty. A gentleman who at the commencement of last year was asked to read a paper, and out of good nature consented, began by a definite confession that he had nothing new to communicate. At the commencement of the present year the same gentleman, in response to the invitation, read a paper, and commenced with precisely similar words. He himself read a paper in response to a request by a member of council; the paper was on the use of sulphocyanide of ammonia as a fixing agent, especially for negatives. When he read that paper, a member of council rose, and said it was not a fit paper to be read, as the subject of fixing with sulphocyanide had been disposed of years ago. Now, as one of the rules of the Society said no paper could be read before it had passed the council, and as that gentleman was a member of council, he thought it was indecent of him to make such a remark when the paper came before the Society.

The **Chairman** hoped the speaker would avoid personality.

Mr. **Hooper** had mentioned no name; but the gentleman was present, and could deal with the matter if he chose. Then whilst the Society had had papers of little importance, they had altogether failed to obtain papers on many most important and novel topics. There was Mr. Crookes' paper on discoveries in connection with light, for which he had received the gold medal of the Royal Society. There was the novel and interesting discovery in connection with light which Professor Tyndall had recently brought before the Royal Institution. There was the important process of polychrome photography, which M. Vidal was introducing in France; the use of boracic acid in the nitrate bath recently introduced by M. Hermagis; Mr Frank Eliot's alkaline bath described in the Year-Book. There were the various processes of photo-engraving; there was the question of carbon prints fading, and other important matters—all as important and interesting as they were novel, and were subjects that the members of the Photographic Society of Great Britain ought to have had brought before them; and he trusted another year would see a great improvement in this respect.

An attempt was made to stop Mr. Hooper's remarks by Mr. **Fry**, who thought the Society met for something more pleasant, and Mr. Hooper's remarks were, he thought, windy. He appealed to the chair as to whether it should go on. The chairman not responding, Mr. Hooper finished his remarks.

The **Chairman** said that by Mr. Hooper's own admission the council had not been inactive in getting papers. He feared that whilst a Royal Society existed the Photographic Society would not have an opportunity of getting such papers as those of Mr. Crookes and Mr. Tyndall. In any case, he should be glad of the aid of Mr. Hooper in getting such papers as he had indicated.

The motion that the report be received and adopted was put and carried.

Herr Warnerke then read an interesting paper on some investigations on the use of gelatine-pyroxyline in collodion emulsions.

After a vote of thanks and some brief conversation, it was agreed to adjourn the discussion, which will be opened by Colonel Stuart Wortley at the next meeting.

Mr. **Bird** announced the report of the scrutineers as to the election of officers, reading them in the order of priority of election:—

President—J. Glaisher, F.R.S., F.R.A.S.
Vice-President—Professor Stokes, F.R.S., D.C.L.
Council—Captain Abney, R E., F.R.A.S.; G. Wharton Simpson M.A., F.S.A.; Lord Lindsay, F.R.A.S.; H. W. Diamond, M.D., F.S.A.; Col. Stuart Wortley, and W. Bedford.

After votes of thanks to the scrutineers and auditors, Mr. **Hughes** proposed a vote of thanks to the president for his services during the year, which was carried by acclamation.

The **Chairman** called attention to the fact that a large accumulation of old journals, which would have shortly to be sold as waste paper, were available for purchase by members at the rate of five shillings for a hundred consecutive numbers.

The proceedings then terminated.

Edinburgh Photographic Society.

The fourth ordinary meeting of this Society was held in the Hall, 5, St. Andrew's Square, on the evening of Wednesday, the 2nd. inst., the president, Dr. **Thomson**, in the chair.

The minutes of the previous meeting were read and approved, and Mr. J. Duncan Gall was admitted an ordinary member.

Dr. **John Nicol**, the corresponding secretary, read a paper by Mr. **George Croughton**, of Lowestoft, on "Enlarging, and Enlarging Processes" (see page 61), which was illustrated by a collection of very beautiful specimens, showing the various steps of the operation, from the carte-de-visite original to the finished 20×16 enlargement; all of which received a large amount of well merited praise.

At the conclusion of the paper the **Chairman** said that their warmest thanks were due to Mr. Croughton for the very interesting paper that had just been read, and for the opportunity that he had afforded them of seeing the beautiful specimens by which it was illustrated. He quite agreed with Mr. Croughton in thinking that the positives or transparencies were much better made in the camera than by any method of superposition, and was sure that under ordinary circumstances the former method was more likely to give the full amount of detail contained in the negative. His own experience of enlarging was so limited that he did not consider himself competent to speak as to the merits of the various methods by which that work might be done, but he was able to form an opinion as to the results which Mr. Croughton had produced, and he thought they bore ample evidence of his ability and skill. While he had no doubt that a suitable process was a most essential thing in any kind of work, he was equally certain that by no process that would ever be invented could anything approaching such high class work be produced, unless it was directed by a talented mind, imbued with the requisite art feeling. From an examination of some negatives sent by Mr. Croughton, he could see that the method of straining paper on both sides gave the artist a greatly increased facility of working out his effects, and he thought there could be little doubt that the evidence showed clearly enough that Mr. Croughton had so used paper, both in private and public, prior to the date of M. Lambert's patent.

Mr. **Ross** said that the members were deeply indebted to Mr. Croughton for the opportunity of examining a collection of such extremely beautiful pictures, and especially for sending with them the transparencies and negatives from which they had been produced. From even a slight examination of such fine work in all its various stages, even the most experienced among the members could not fail to learn something. In common with many others, he had frequently had doubts as to whether the camera, or superposition, was the best for the production of the transparencies, and within the last few days he had felt quite satisfied that the former gave a softness and delicacy that could not be got by the latter method. Mr. Croughton's method of making 8½ by 6½ transparencies gave greater facilities for the necessary retouching, which, when judiciously done, undoubtedly improved the picture; but while admitting that, he felt constrained to say that in too many cases the retoucher aimed at producing pretty pictures, rather than honest truth. Such an observation, of course, did not apply to Mr. Croughton, who, by the specimens on the table, proved himself a workman that need not be ashamed of his work.

Mr. **Bashford** said that he was very much pleased with the specimens, and they were very beautifully done. He had used a good hundred feet of the transparency tissue in the production of transparencies, but he should never use it again, and would not advise anybody else to do so. He had a large number of transparencies made with it, that he would defy any man to make good negatives from. If anyone wished to make transparencies in that way, he could cordially recommend the special portrait tissue, "brown tone," which would be found all that could be desired. To those who wanted perfect transparencies that could not be improved, he would strongly recommend the beer and albumen plates. He had recently got a few of these from Mr. Matheson, and the results were simply perfect. He might say that for years he had been in the habit of making large sized transparencies—frequently, indeed, up to the full size required—and that he had from them made paper negatives, as had been recently suggested by Mr. Blanchard.

Mr. **Tunny** thought Mr. Croughton's paper very seasonable. While of much value to all connected with enlarging, he thought its main point was the way in which it dealt with the question raised by one of M. Lambert's patents, as to whether photographers were entitled to use paper on both sides of a negative. This was a point of considerable interest to members, and it was only right that they should give expression to their opinions on it. For himself, he was quite satisfied that Mr. Croughton had a prior claim to that useful method of working on negatives, and as he had freely given it to the world, the claims of M. Lambert could not be substantiated. He did not begrudge M. Lambert the great success that he had gained in the introduction of his methods of working, and he had no doubt that those who had been taught his extremely beautiful method of manipulation would find that their money had been well spent. With the exception of the use of paper on both sides of the negative, Mr. Croughton makes one 8½ by 6½. He strengthens his transparencies, and M. Lambert does not; while Mr. Croughton makes a strong, dense negative, and M. Lambert keeps his as thin as possible, trusting to get sufficient density by the plumbago applied to the paper with which the front and back are covered. They could all judge for themselves of the beauty of the results obtained by Mr. Croughton, and he could assure them that he had seen at least one picture by one of M. Lambert's pupils, that was perhaps the finest piece of work that he had ever seen. He quite agreed with Mr. Croughton, that it was nonsense to say that anybody could by either method of working produce fine results. The results depended not so much on the process, as on the talent and ability of the artist; and the pictures on the table showed unmistakably that Mr.

Croughton was a manipulator of the highest order. He thought the members were very much indebted to Mr. Croughton, both for his admirable paper, and the beautiful specimens by which it was illustrated.

Mr. W. **Neilson** said that it was well known that he was no advocate for enlargements, but he could not help saying that Mr. Croughton had contributed an admirable paper, and backed it up by some really fine specimens, that would do credit to anybody. Referring to the question of the right to use paper on both sides of a negative, he said that sixteen years ago, when hard negatives were the rage, he had used that method of manipulation to soften and remove the violent contrasts that were so disagreeable in some of his work.

Mr. **Turnbull** had tried the ordinary transparency tissue, but could not get it to work satisfactorily; but succeeded very well with the special portrait tissue recommended by Mr. Bashford.

Mr. **John Lessels**, architect, then read a paper descriptive of "A Short Tour with the Camera in Belgium" (see page 63); but as the hour was late, it was not followed by any discussion. It was illustrated by a number of fine photographs by both himself and the vice-president, Dr. Sidey, which were much admired.

The report of the council regarding the proposed exhibition was then considered, and it was resolved that the Society should hold a photographic exhibition in December, and that the necessary steps be taken to invite contributors from all parts of the world.

A distribution of pictures, contributed by Mr. Crighton, was then made by lot in the usual way, and after hearty votes of thanks had been given to Mr. Croughton, Mr. Lessels, and Mr. Crighton, the meeting adjourned.

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Talk in the Studio.

Painter and Photographer.—Many photographers who have admired the charming pictorial compositions Mr. H. P. Robinson has produced by photography, know that he originally resigned the palette and pencil for the camera, having already started a career as painter with much promise when he became fascinated by photography. The old love has again been exercising sway over him, and he has given some time to painting. In the most recently opened gallery of paintings in London, that at the Westminster Aquarium, Mr. Robinson has a fine landscape hung, entitled "A Quiet Evening in October." The picture is hung on the line in a capital position, where it may be seen by any of our readers visiting the Aquarium.

"**On Good Taste.**"—The interesting article with this title which appeared in our Year-Book, bearing the name of M. R. Faulkner as author, is, we are informed by that gentleman, not from his own pen, but was written by his nephew, Mr. George F. Wetherbee. As we received the MS. from Mr. Faulkner without any name, we naturally accredited him with the article, in doing which we join with Mr. Faulkner in regretting we have done some injustice to Mr. Wetherbee.

Masks and Discs.—The practice which has maintained of late, and which is certainly most effective, of printing portraits in medallion with a tinted or diapered margin round the medallion, has called into necessary existence fresh appliances in the shape of masks and discs fitting each other accurately, so as to secure a good result without much trouble. A series with which we have been favoured by Messrs. Mann and Fursman are admirable in shape and proportion, clean and neatly cut, and quite opaque—all, in fact, that the photographer can in this kind of work require.

Explosion of Chromic Acid with Glycerine.—Experimentalists using the salts of chromium and organic substances should be careful how they bring chromic acid and glycerine into intimate combination. A case is related by Austrian journals which suggests caution. The following mixture was ordered for external use: 7·5 grains chromic acid, and 60 grains glycerine. The chromic acid was mixed with water in a flask, and the glycerine mixed with it by shaking. Suddenly the contents of the flask exploded with a loud report, flying all about the shop, while the vessel remained unhurt in the hand of the astonished apothecary, and was covered with a black mass. This case deserves the more notice because the quantity was so small and the detonation so extremely violent.

Photography as a Business is comparatively of so recent a date that the general public is inclined to consider it as not much else than any other trade: "Give me what I want, and I will pay for it." They do not think that it is anything more to offer a face for a picture than to offer a foot for a boot to the shoemaker, and reject it if it does not suit. Here the shoemaker has the advantage, as he can sell the refused boot to somebody else; but this resort of reimbursing his loss is almost impossible with the photographer. Most people do not know that "to sit for a likeness" is an expense of materials and time, besides the labour to the photographer. Their general idea is that, when they pay for the picture, it is the price of that picture or card, just as they pay it for a pair of gloves. Yet no person of common sense would try on seventeen pairs of gloves, and ruin them for further sale, without at least buying one pair.—*Anthony's Bulletin.*

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To Correspondents.

Virtuoso.—Of course there was a number of the Photographic News published on April 2nd, 1875, and the number can be had at once on applying to our Publishers.

S. R. M.—As a rule, travelling photographers who attend fairs, &c., have a caravan-like studio on wheels; some have a glass room, the portions of which will readily screw or bolt together. Of course it will be possible to improvise some such rough arrangement as you propose, but it will be attended by some inconveniencies and difficulties. You cannot well use glass in such an arrangement, but you can admit light easily anywhere. If you require the contrivance for occasional use only in fine weather, we should recommend something still simpler. Have a light framework covered with canvas, consisting of a background about seven or eight feet high and six feet wide, with two swinging wings, and a canopy attached, each about six feet. With this arrangement and a movable screen you will be able to produce very good portrait effects, and probably with less trouble than with a more elaborate canvas structure. If you prefer the latter, light should be admitted on the north side and roof, so as to fall on the face between the side and front. Curtains sliding on metal rods with rings would afford easy facilities for managing such light.

G. G. B.—One of the best books of instruction in photography which we know, giving the student some knowledge of the chemistry of his art, is Captain Abney's Instructions, to be obtained of Messrs. Piper and Carter. We do not know of any round brass frames for transparencies. Write to a dealer, who will probably be able to give you the required information.

W. R. (Hampstead Road).—The remuneration of operators varies very much, ranging from thirty shillings to four or five guineas or upwards per week. We believe about two guineas a week constitute a fair salary for an ordinarily good operator. But ability, and the need for ability, vary much, and hence remuneration varies probably in a like ratio.

M. R. D.—A fixing bath made with one ounce of hypo in eight of water is rather weak, and, if used at the very low temperature we have frequently had lately, would be insufficient to produce perfect fixation, and this would account for the condition of the prints you describe. Warm your hyposulphite solution to a temperature of 60° Fah. We prefer the solution not weaker than one in five, or a quarter of a pound of hypo to a pint of water. 2. Carbon prints properly produced are undoubtedly permanent; but it is possible to work the most perfect process imperfectly. Instead of carbon, or in combination with carbon, it is possible to use fugitive colours. If carmine be added, for instance, to give a rosy richness to a tissue prepared with lampblack, the carmine will fade and leave the print a dead black, all the rosy bloom being gone; and so on. In fact, all processes are capable of misuse, but that is no stigma on the process.

H. G. L.—Sheet gelatine is kept by many fancy stationers. On page 139 of our seventeenth volume you will find several addresses where it can be obtained in London. It is prepared by Messrs. Nelson, Dale and Co., gelatine manufacturers. Sometimes it is sold by confectioners, sometimes by artificial flower makers. 2. The date of the patent of Mr. Henry Swan's casket portrait was December 4th, 1862, number 3249. We do not know whether the protection was continued; if it were the patent will expire at the end of the year. You can ascertain by inquiring at the Patent Library in Southampton Buildings.

One who Tries.—There is no remedy for metallic spots in papers. It must be wasted or used for unimportant work. The samples you send suggest having come into contact with some reducing substance like particles of sulphate of iron.

A Wellesley Turner.—The prints are excellent. Many thanks.

C. A. **Smartt.**—In our next. Thanks.

Fairplay.—In our next.

Several Articles in type are compelled by the pressure on our pages to stand over until our next.

Several Correspondents in our next.

The Photographic News, February 18, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Athenæum upon Permanent Photography—How to Make Money as a Travelling Photographer.

The Athenæum upon Permanent Photography.—"Permanency is an over-bold promise to make of any process connected with photography," says the *Athenæum*, in referring to a new edition of Pepys' Diary; and while admitting that "the illustrations are good," our literary contemporary advises its readers not to put their faith in the permanency of "any process" connected with photography. We should have hoped for better things from the *Athenæum*, for recently we have seen some favourable critiques on photographic pictures in its columns, where, but a year ago, nothing too bad could have been said of photographers and their works. We should have thought, too, little of a literary and art journal speaking upon such a question as permanency in photographs, but as the *Athenæum* professes to be scientific also, and a good portion of the paper is now-a-days taken up with scientific news that is very widely read, it will scarcely do to permit such a statement as we have quoted to go forth unchallenged. The writer, no doubt, like many other people, has possessed in his time photographs of different kinds which have shown signs of fading, and hence he rashly concludes that all pictures photographic, whatever their nature, must of necessity be of a fleeting character. There are some photographers of standing, we could name, who will not admit even that silver prints are not lasting; but it is mere nonsense, and nothing else, to challenge the permanency of photographs produced in greasy ink, or in Indian ink. He would be a rash man who would question the permanency of carbon pictures now-a-days, and as to photo-enamels, there are few things in this world, we think, that will remain unchanged so long as these. Of course we employ the term permanent in the ordinary sense only, and mean that durability depends upon due care, or rather an absence of negligence. A printed book is a permanent thing under ordinary conditions, and a photograph in Indian ink, or in fatty printer's ink, would naturally be quite as permanent, while an enamel would be far more so, for the latter would resist the influence of extraordinary conditions to which the book or picture would succumb. The critic of the *Athenæum* may rest perfectly assured that the Woodbury photographs in the new edition of Pepys' Diary will last quite as long as the letterpress portions of the book, and that he need not regard photography as a "bugbear" any longer. The print, as he sees it, has been produced by a simple mechanical process, and there is no necessity at all to run away with the idea that permanency and photography are opposite terms. We have no hesitation in saying that, taking into consideration the many mechanical and carbon prints that are produced now-a-days, the larger number of photographs printed at the present moment are permanent. There is no need, therefore, to go on depreciating the work of the photographer, as it has been the fashion to do for some time past, and now that the *Athenæum* has admitted that it is possible to have artistic photographs, we can further assure the writers in that journal that the pictures not only can be, but have been for some time past, produced of an inalterable character.

How to Make Money as a Travelling Photographer.—In one of the German papers appears an account of how a travelling photographer is in the habit of managing in order to do a thriving business in the towns and villages he passes through. His first errand on arriving at a new locality is to seek out the school of the place, and beg permission to take a photograph of the little scholars massed together in a group, with the schoolmaster, of course, in the centre; and in return for their condescension he had a practice of making the master a present of a copy of the picture, for himself. The man knew human nature too well not to be perfectly aware that every boy and girl included in the group would not remain quiet till he or she possessed a copy, and a moderate price being fixed as the price of the picture, as a matter of course orders flowed in. As it was usually the parents who bought and paid for the pictures, the photographer naturally enough came under the attention of the elders in the village, and the man, stopping a few days in order to execute the orders given him, had further commissions put into his hands. In this way he would, in the end, execute portraits of a large number of the villagers, and thus make a very good profit on the whole transaction. His plan of advertising himself, it seems, rarely failed, and the portrait he gave away in the first instance to the schoolmaster brought him far more work than he could possibly have obtained by making himself known in the ordinary manner.

ON MAGNITUDE AS AN ELEMENT OF ATTRACTIVENESS IN PHOTOGRAPHY.

BY F. F. STATHAM, M.A., F.G.S.*

If anyone were to be asked to define the greatest advantage which has resulted from the practice of photography, his first impulse would probably be to refer to the minuteness and exactitude of its reproductions.

He would instance the fact that even the smallest photograph, if carefully and artistically rendered, would bear examination under the microscope, and would, when subjected to this test, bring out details which were invisible to the naked eye. The portrait of an individual, for example, would exhibit the trace of a scar, or the existence of some minute defect, which might never have been noticed by the most intimate friend of the original; or the view of some imposing architectural elevation would show an inscription or a marking on a particular stone which was all but invisible to the eye upon a distant inspection.

This is undoubtedly the case, and it may, perhaps, be fairly asserted that the popularity which from the very first attended the introduction of photographic portraiture was due to this cause. The public were literally astonished at the fidelity with which not only each feature but every blemish was reproduced; and, pardoning the sometime unwelcome truthfulness which scorned to register beauty without at the same time chronicling defect, it accepted the camera as the most faithful expositor of the reality, and gave a hearty welcome to each undoubted improvement in its use as a substantial gain to the cause of advancing science. One result, however, of this wonderment and consequent approbation was a tendency on the part of operators to adhere to that minuteness of portraiture which had first secured the public regard. All their efforts were directed to the obtaining of *perfect miniatures;* it was scarcely considered desirable to risk the experiment of photographing on a larger scale.

It was only by degrees, as new labourers came into the field, as fresh processes were discovered, and as larger and more costly machinery came into general use, that the original miniature-sized carte-de-visite began to assume a more pretentious air, to develop into the "Cabinet," the "Boudoir," or other enlarged portraits with which we are now so happily familiar. This gradual growth of the size of plate employed, not only for portraiture but for landscape and general photography, seems to me to indicate a natural yearning on the part of mankind for something more satisfying to the eye than the mere prettiness and wonderful accuracy of minute representation. It is akin to the feeling with which, while we appreciate and admire the reticulations on a single leaf, we stand in amazement before the glories of the sunlit forest glade—while we view with delight the graceful form of the miniature gazelle, we are struck with awe at the aspect of the majestic monarch of the woods. In other words, prettiness and beauty each makes a distinct appeal to the æsthetic principle within us, and there is a feeling of dissatisfaction in the mind when we see that which is admirable on a scale too minute to come up to the full measure of our reasonable expectations.

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* Read before the South London Photographic Society.

No man who has once looked upon the "Venus de Medici," or the "Apollo Belvidere" (sculptured as they are of the life-size) would ever be content to exchange them for statuettes of the same figures carved in ivory a few inches long, were the workmanship ever so perfect; and, *vice versa*, if bronze or ivory models only of these exquisite pieces of art had come down to our days as minute representations of the full-sized statues, who would not have looked upon them with a sentiment of yearning for something approaching more nearly to the "Godlike statue of man?"

That a feeling somewhat akin to this has actuated the public mind with regard to photographic portraiture seems apparent from the fact that numerous, and in many instances highly-successful, efforts at enlargement from the negative have been suggested of late years. The noble example set by Mr. Crawshay in offering prizes for this especial branch of photography may have done much to stimulate exertion in this field; but the craving for a grander scale of representation than that which at first gave satisfaction seems to me to lie at the root of all this ingenious activity.

I think we may be said to be standing now upon the middle ground between a hearty appreciation of the triumphs of the past, and a hopeful anticipation of what photography may be able to do for us in the future in respect to enlarged artistic results. I am sanguine enough to think that we are but standing on the threshold of discovery when we contemplate what may be the future of this grand and interesting art. The steady progress which, from the very first, has attended its footsteps, and the almost unending variety of application of its useful processes which each year is witnessing, justify us in predicting brilliant successes hereafter to be realised. Let us not be fainthearted; let us have faith in the possibilities of the camera, and patient exertion will, in the end, ensure renewed triumphs. *Possunt quia posse videntur* was the dictum of the old Romans —"They are able to do (a thing) because they seem to be able to do it;" and, doubtless, many of our greatest discoveries in science have resulted from this energetic faith. My object, then, in writing this paper is to invite further speculation upon this question of enlargement. I am not presumptuous enough to imagine that I can solve the difficulty myself; but I lay before you one or two suggestions, more by way of inaugurating a discussion upon them than in the hope of seeing any immediate solution of the question.

We cannot be blind to the fact that every effort to produce enlargements from an originally small negative must labour under the disadvantage of unintentional exaggeration. A wrinkle, for instance, or even a sweet dimple with its natural shadow in the minute similitude, may be magnified by the process of enlargement into a sinister expression, or, perhaps, even an absolute scowl. It is the province of true art to tone down these exaggerations, and we know that in the *ateliers* of our best photographers skilful arrangements exist, either in the mode of lighting the figure or of retouching the negative, by which these almost unavoidable crudities of the enlarged picture are removed.

But suppose it were possible to secure at once all the delicacy and correctness of the smaller style of portraiture with the bolder and more striking effect of the same features rendered "life-size," can we doubt that photographic art would have made a grand progressive stride? Let us imagine for a moment that at one of our annual exhibitions, instead of beholding upon the walls a series of portraits or views—admirable, indeed, for their truthfulness to nature, yet still, from their minuteness of delineation, requiring a constant "craning of the neck" and a closeness of inspection fatiguing in the extreme—we could have our sight regaled with some such scene as is to be witnessed annually in the rooms of the Royal Academy, at Burlington House. Portraits, for example, life-size, not necessarily coloured (though, for my part, I can see no valid reason why painted photographs, some of which are so effective, should be excluded from exhibitions), historical scenes, landscapes, interiors, ruins, sea views, *genre* pictures—all on a scale capable of being viewed at a moderate distance without any straining of the sight, can we doubt, I say, whether such an exhibition would be successful? And are we, then, bound to confess that, although up to the present time photography has not achieved such triumphs, it is impossible to conceive that it ever should do so?

With the advances which have recently been made in the various enlargement processes, with the progressive improvements in carbon or autotype printing, with the introduction of sensitized tissues capable of being extended to any size, to say nothing of the improved character of our modern cameras and lenses, I think he would be a bold man who should pronounce the realisation of such an idea impossible. I may be reminded that, by combination printing, we could already, with our existing mechanism, achieve such a result, but that it would be too costly an experiment to carry out. It may be suggested that all we should have to do would be to construct colossal cameras, and to devise our baths, our glass plates, and all our apparatus upon so enlarged a scale as to secure a grand result at each single direct exposure.

Well, do not let us be frightened at the thought of increased exertion or cost, if we could only be assured that success would be likely to crown our efforts. These are days of gigantic designs. Our harbours of refuge capable of sheltering the navies of the world, our network of railways, our submarine telegraphic lines, our "Woolwich infants"—all tell of the ease with which colossal efforts are made when corresponding results may be fairly anticipated.

It never entered into the wildest speculations of Sir Isaac Newton that a gigantic reflecting telescope, like that of the late Earl of Rosse at Parsonstown, could ever be constructed; but the erection of that magnificent instrument led to the resolution of the nebulæ into separate groups of stars, and opened up a new future to astronomy. And I suppose we shall all agree that the extreme limit of size and effectiveness to which cameras may be extended has not yet been reached. It is probably more a question of expense than of possibility which stands in the way.

If some wealthy patron of the art were to offer the means of constructing a camera upon the grandest scale compatible with our present optical capabilities, might we not anticipate some very novel and interesting results in the character of the plates produced? Or, is it even absolutely necessary that any very exaggerated sum would be required in order to ensure such results? As a matter of course, the body of the camera would be made of cheaper materials than those now in use in our delicate cabinet work. The fittings need not necessarily be of brass, nor the wood of polished mahogany; the lenses (aye, as Shakespeare says, "There's the rub"—well, the lenses—would they of necessity have to be constructed entirely of glass? or, if so, need they be absolutely cast in single pieces of so large a size? Might they not be made in sections, to be afterwards neatly joined together? I am not now speaking of the achromatic arrangements which we know can be so made, but of the separate segments of some imagined colossal lens. We must remember that the photographic camera, after all, is only a kind of enlarged mechanical eye, of which the focussing apparatus is the crystalline lens; the stop and racket work the iris, with its wonderful arrangement for varying the size of the pupil; the ground glass the choroid coat; and the sensitised plate the retina, with its nerve connections communicating the perfect impression to the brain.

Many of the Dutch philosopher's (Muschenbroek) most important discoveries in microscopy were made, not with carefully-polished lenses, but with small filaments of glass melted in the flame of a spirit-lamp and flattened on a smooth iron plate to the requisite curvature. And so, possibly, I would venture to suggest, a camera lens on a gigantic scale might be constructed (at least for the purposes of experiment) with glass for its centre as the representative of the crystalline lens in the eye, and with acidulated water, alcohol, turpentine, Canada balsam, or some other suitable liquid, enclosed in properly-shaped glass vessels, to imitate, as accurately as possible, on a large scale, the achromatic effects of the aqueous and vitreous humours in the natural eye. Or, probably, when the experiment came to be tried, it might be found that the lens, if of glass, need not be made on so large a scale as might at first sight appear necessary. The stop usually cuts off a considerable portion of the outer rim or circumference.

Would it be absolutely necessary to construct this part of the lens which is so usually stopped out? Would not the same effect be produced if the lens were polished only to the smaller size, making due allowance for the action of the stop? These and similar questions are, however, rather matters for discussion by practical opticians than for mere amateurs like myself. I would not be so rash as to pronounce a positive opinion on the subject, though I cannot help thinking that the difficulty is in some way to be overcome.

America (the country of inventions as of natural scenery on a grand and imposing scale) is about, we are told, to construct a telescope as far surpassing that of the Earl of Rosse as his exceeded all that had been witnessed before. Shall we leave it to her to take up the idea of a "Brobdinagian" camera and to cover the walls of her forthcoming Philadelphia Exhibition with triumphs of photographic art which shall throw into the shade all that we of the Old World have hitherto been able to accomplish? I have seen some magnificent examples of what she can do already in the way of large plates in the splendid scenery of the Yosemite Valley; but I hope, in no spirit of rivalry, but in the honest endeavour to push to the utmost available extent the resources of that fascinating art which we cultivate in common, we shall not without a struggle give up the palm for grand and striking results in direct photography on a far larger scale than anything which has hitherto been submitted to the approbation of a curious but intelligent public.

A NEW FORM OF STUDIO.

BY C. W. SMARTT.

I had intended to send you, for the Year-Book, a paper embodying the following remarks, but was unable to prepare it in time, and so I had put it on the shelf for some future opportunity. Seeing, however, the announcement in the News of the erection of a studio of novel form by Mr. Blanchard, as well as a reference to a new mode of lighting by Mr. Slingsby, I am led to think that the question of the best form of studio is again attracting attention. Having for some years given a good deal of thought to the subject, I beg now to place at the service of my brother photographers the following remarks and description of models which I constructed some eight or nine years ago. My intention at the time was to bring them under the notice of the South London Society, but various circumstances prevented my doing so; and having since left London, I have not had the opportunity. I, however, adopted the principle I am about to describe in constructing my own studio about three years ago, and have every reason to be satisfied with the result.

The leading principle with which I started is one now, I believe, generally admitted, viz., that the light entering the studio should suffer the least possible loss by reflection; *i.e.*, should pass perpendicularly through the glass, so that the operator may be enabled to use, if required, all the light that the glass surface is capable of transmitting.

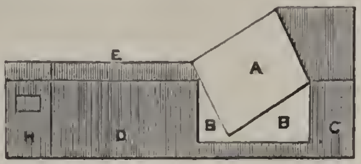
Secondly, that this condition should especially apply to those rays which impinge upon the sitter in such a direction as to give the greatest amount of roundness and relief.

Thirdly, that this direction (speaking roughly) is such as would meet the eye of a person seated in the centre of one side of a square room, and looking up to either of the further corners of the ceiling, viz, to a point equidistant from the front, top, and side of the cube. This is to be understood as applying to the principal light in ordinary portrait work.

I made these models to illustrate the application of this principle to the construction of a studio under three conditions of aspect, space, &c., most likely to occur.

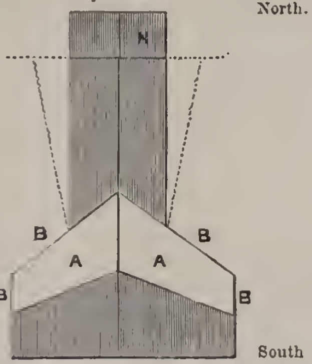
The annexed diagrams represent the models. No. 1 somewhat resembles that known as the "tunnel form," but, instead of the principal light being directly over the front of the sitter's face, it is divided into two large surfaces, A A, giving a direct light each way, as stated in proposition 3rd, above, the side and lower front lights, B B, affording the means of modifying and balancing the principal light; all being, of course, provided with suitable blinds or shutters. The sitter is at C, and camera at D. The tunnel, E, may be extended if necessary, as shown by the dotted lines. The dark room is at H.

No. 1.



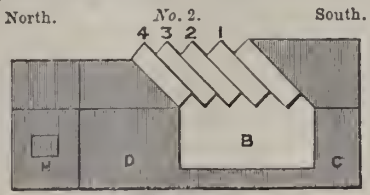
Side View.

Top View.

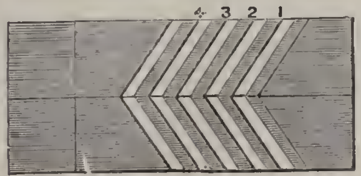


No. 2 gives the ordinary ridge roof, the top being

No. 2.



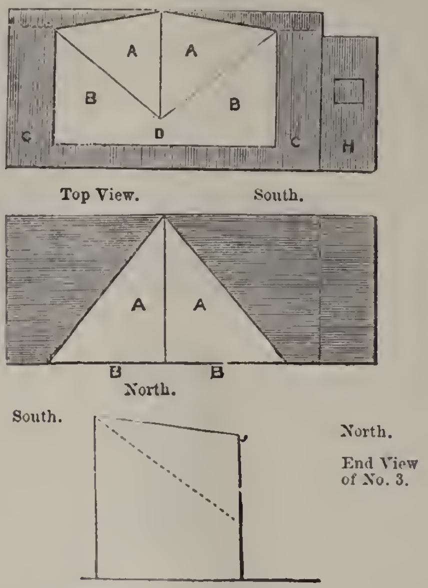
Side View.



Top View.

divided into sections, 1, 2, 3, 4, &c., one side being glass, the other opaque. I have not seen the Vanderweyde arrangement, but I think this is in some respects similar, although with this important difference, that I believe Mr. Vanderweyde's sections lie transversely across the roof, whereas in my plan they are placed diagonally, as shown in top view, thus giving as far as possible the effect of No. 1; although I do not consider the arrangement so perfect, and merely intended this to apply to existing ridge-roof studios, where it would not be possible to adopt form No. 1.

No. 3 shows the application to a lean-to or semi-ridge roof with north aspect. In this case there are two principal lights, serving to illuminate the opposite ends of the studio, the light coming from the side in each case. In my own studio, which is from necessity very low in the roof, I have applied this form of window with satisfactory results.



No. 3.

The letters refer to similar parts in all the three diagrams. The white parts represent glass, and the shaded portions opaque.

NOTES FOR A SHORT TOUR IN BELGIUM WITH THE CAMERA.

BY JOHN LESSELS.*

The station at Ghent being on the outside of the town, we hail a cab, and drive to the Hotel de la Poste, Place d'Armes, where we know we shall have excellent accommodation at a moderate cost, and in Mons. Van de Putte a most obliging landlord. It being now five o'clock, we join the table d'hote for dinner, and come to the conclusion that, with the aid of a glass or two of good old Bordeaux, we shall be able to make ourselves comfortable, even with a Belgian *menu*, and that, in fact, the foreigners seem to appreciate good living as much as we do at home.

Dinner being finished, we now proceed to have a view of the town. Finding nothing of interest in the Place d'Armes, we pass through a short street, and arrive at the Palais de Justice, a rather large and pretentious modern building in the Italian style. Crossing the river Luys to the Quay au Blé, we obtain a fine view of the old Spanish houses on the opposite quay, lighted up by the evening sun, which, with the gay-coloured vessels on the water, make such an agreeable combination that puts us in a *que vie* to get to work. Having looked at this from different points of view, we go on through the Rue des Selliers to the Place de Pharolde and Marché des Poissons.

The general view here, looking from the south-east corner across the Place, where the circular towers of an ancient gateway come into play along with the quaint houses on the north and west sides of the Place, makes an excellent picture, whilst several successive pictures may be taken of the houses separately. Recrossing the Luys again, and passing through the vegetable market and along the Longue Rue de la Monnaie, we enter a noble square called Le Marché de Vendredi, where almost every house is a study in itself. In the centre of the square is a colossal statue of Van Artevelde, a great captain-general of the Flemish. Leaving the square by a narrow cross street, we pass on to the Marche de Beurre, on the north side of which stands the magnificent, but, unfortunately, never-completed Hotel de Ville; on the west the picturesque tower of the Beffroi. One glance at the Hotel de Ville shows that it has been erected at two distinct periods, one part plain to extremeness, and the other equally florid. The more florid part presents an excellent specimen of the Burgundian Gothic, the whole wall surface being covered with moulded panelling and niches, but, in this respect very unlike our houses of Parliament at Westminster, where this becomes tiresome and monotonous, it is so broken up and varied in its outlines that the eye is never tired, and, even in its incomplete state, it is the finest building of the kind in Belgium. Three minutes take us on to the Cathedral of St. Bavons, which is so hemmed in with other buildings on all sides that little of the exterior can be seen at one time; but, on entering, every one is struck with its noble dimensions; but from the great variety of materials, and the strong contrasts that exist in the colours: first of the dark oak pulpit and its white marble statues, then the white marble in the screen, and its black marble cornices and panels, which are also carried round the sides of the transepts, and the different coloured marbles and gilding of the high altar, with the richly stained glass windows in the clerestory, all combined, form a noble subject for the painter, but prove very refractory in the camera.

Among the many fine pictures to be found in the side chapels of the choir, one by the brothers Van Eyck, of the "Adoration of the Lamb," is particularly worthy of notice, both for design and colour, every colour being as fresh as when first painted; showing that with all our improvements, whatever we may do in design, our *technique* has retrograded in place of advancing.

Passing along the streets, we meet here more monks and nuns than we have seen before in our journey; the former with their long brown robes and cowls, and the latter, who are of the order of begging nuns (Beguins), dressed much in the style of our sisters of mercy. The Beguins are a numerous body, the old Beguinage having about seven hundred sisters, forming a small town of themselves, and having a handsome church for their own use. In their magazine is a beautiful painting of the head of our Saviour, said to be by Raphael. Another class of females who attract attention are the peasants, who come in from the country with their little milk carts drawn by handsome mastiffs, the vessels being bright polished brass of elegant form; while the dames are clad in long black cloaks with high-crowned, narrow-rimmed straw hats, under which they wear snow-white caps and broad lappets hanging down their shoulders covered with the richest embroidery, forming a very picturesque costume, each seeming to vie with her neighbour who shall have the gayest and handsomest ribbons. This proving enough for one day, we agree to examine the other churches and places of interest before we begin operations, as we are satisfied that we cannot devote less than eight days to accomplish all we desire here.

Between hands, for a change, we make a run to Oudenarde, a ride of three-quarters of an hour, the principal object of attraction being the Town Hall, a much smaller building than that of Ghent, and less elaborately finished, but very complete in itself, and forming an excellent subject for the camera from all sides, as it fronts the Grande Place on the one side, and on the other a wide street. The interior of this, which remains in its original state, gives a very good idea of what these buildings generally were, with their massive oak ceilings and quaint projecting and highly ornamental chimney-pieces rising to the ceiling of the rooms. The old porch to the entrance to the council-room is elegantly designed and finely carved, and is so much prized that it was taken down and sent over to the Great Exhibition of 1851 as a specimen of carving. Immediately facing the Hotel de Ville there are some old houses elaborately finished in the Flemish style, and which are worthy of being photographed.

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* Continued from page 65.

The exteriors of the two churches do not present much worthy of notice, but the interior of St. Paumele will well repay a visit. Three years ago it was discovered that the large pillars between the arches, which at that time were square, had originally been round; and on the plaster and brickwork in which they were incased being removed, the old pillar was found to be decorated in colour; and farther investigation showed fine early Gothic foliated capitals with boldly-sunk arch mouldings all richly coloured to correspond with the pillars, and in excellent harmony and taste; a complete transformation having been effected at some distant period, and the Gothic features all plastered over and finished with very poor Italian details. I happened to be there at the time the pillars were laid bare; and, speaking of it to Monsieur Caneel, the Director of the Government School of Design in Ghent, he told me that Government had ordered the whole to be restored to its original state; and when this is done it will be one of the most unique churches in either Belgium or Germany.

Another day we devote to Malines; and as it is a large town, we must start with an early train, the journey occupying about one and a-half hours. The station is on the outside of the town, and proceeding thither we meet with a curious old turreted and arched gateway that must be photographed. A little farther on we come to the Grand Pont, the general view from which, with the quays on each side of the Dyle, makes a good picture; while a number of the houses on the quay form a succession. A little beyond this is the Grande Place, on one side of which is the grand old cathedral with its massive unfinished tower three hundred and fifty feet in height, at present all undergoing repair, and a number of fine old houses all round the place.

The cathedral possesses some valuable pictures, and both interior and exterior afford good subjects for the camera, all of which can be managed in a day, and return to Ghent in the evening.

Before leaving Ghent we visit the Picture Gallery, which is hardly worth its place, and in the evening the Academy des Beaux Arts, under the skilled and able direction of Monsieur Cancel and an efficient staff of assistants, and are much delighted with the thorough system of teaching, and the great number of able pupils there, being over eight hundred, out of a population about one-half the number of Edinburgh.

(To be Continued.)

A MODE OF USING SULPHURET OF POTASSIUM FOR THROWING DOWN SILVER WITHOUT CAUSING AN OFFENSIVE SMELL.

BY HENRY T. ANTHONY.*

Many photographers choose to throw away their waste fixing solutions because they cannot use the sulphuret of potassium without inconvenience, both on account of its smell and the injurious reaction of the sulphuretted hydrogen upon their prints and photographic preparations. Any method that will obviate these inconveniences will necessarily be of interest to all photographers who desire to conduct their business without unnecessary waste.

A method which I have devised will accomplish this object thoroughly. All that is needed is a peculiar bottle or vessel of glass open at both ends—the opening at one end being quite small, and the other large enough to admit of the introduction of sulphuret of potassium in moderately-sized pieces. To use it, cork the smaller opening and fill the vessel with water through the larger opening; introduce as much sulphuret of potassium as the water will dissolve (no more), and cork tightly the larger opening.

When the sulphuret is dissolved, put the waste solution in any convenient vessel, and, turning the bottle containing the sulphuret solution larger end down, immerse the cork and the end of the bottle below the surface of the waste solution and remove the cork; now, holding the bottle with one hand, slightly open the upper end by partially drawing out the cork. The sulphuret solution will descend into the hypo solution, but its escape can immediately be arrested by pressing the small cork into its place. By proceeding thus gradually, stirring the hypo solution for the purpose of diffusing the sulphuret throughout it, the silver contained in the hypo solution will be converted into the sulphide, which is insoluble in water. As long as there remains in the hypo solution any silver uncombined with sulphur, no smell of sulphuretted hydrogen can be perceived proceeding from the hypo solution. When the operation is completed, the excess (if any) of sulphur poured into the hypo will commence to escape into the atmosphere of the apartment, and can be smelt. This can instantly be arrested by pouring into the vessel containing the hypo solution a small quantity of the latter, which should be reserved for this purpose. The cork is now replaced in the larger opening of the bottle underneath the surface of the hypo solution, and the bottle can then be removed, a mere trace of the sulphur odour having escaped into the apartment.

NOTE ON CAREY LEA'S EMULSION PROCESS.

BY M. CHAMPION.*

In the *Bulletin* for June, 1875, Mr. Carey Lea indicated a new process of preparing dry plates by means of an emulsion, enclosing the preservative.

By reason of the importance of this matter, I tried the process at once; but, despite the precautions which I took, and particular care in following the indications of the author, I was quite unsuccessful in my work. For this reason I desire to make one or two observations upon the subject.

Mr. Carey Lea tells us that the collodion of the emulsion, after having in part evaporated to a jelly, must be added to the preservative, and then freed by washing from all soluble matter. Nevertheless, I found that the preservative indicated formed no insoluble compound with nitrate of silver, of which there remained a little excess in the collodion. Washing, therefore would remove all the preservative from the emulsion again. It is the same thing, it seems to me, as washing a collodion plate as soon as the preservative has been applied, supposing the latter is incapable of forming an insoluble compound with the silver solution.

I may say, however, that by having recourse even to incomplete washing, I was not able to secure the best results.

Mr. Carey Lea tells us, further, that the jelly may be dried on a stove if the heat is not greater than the hand can bear, which is about 50° Cent., therefore; but I found that under these conditions the dried emulsion is only slightly soluble in a mixture of ether and alcohol.

Plates prepared with collodion, dried over a stove, and exposed for a considerable period, did not give the slightest trace of an image on development, even if they were intensified. I think, therefore, it would be well if the French Photographic Society could induce Mr. Carey Lea to give a very detailed account of his process, which I will engage to try with the greatest care.

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* Read before the Photographic Section of the American Institute.

* Read before the French Photographic Society.

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The Photographic News.

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GRATUITOUS SITTINGS.

Amongst the questions which will be discussed at the first convention of professional photographers—should such a convention ever meet—will be, amongst others, relating solely to the commercial interests of professional photographers, the questions: How many sittings, or how many re-sittings, are fairly due to a client for one payment; and to what extent is it prudent to render prepayment a rule in photographic portraiture? Possibly, after a full discussion of the subject, it might be decided that no inflexible rule for general application could be framed on such subjects—that it must be left to the prudence and judgment of each photographer to decide what arrangements were best suited to his especial *clientelle.* In the meantime both questions are often found very perplexing by many portraitists, either course being at times attended with objections very difficult to deal with. The case of Mr. Frank E. Pearsall, of Brooklyn, to which we recently referred, illustrates one of some of these difficulties. We before stated that he sued a gentleman, who declined to order portraits after seventeen sittings, or to sit again, for twenty-four dollars, as remuneration for these sittings, and obtained a verdict. It may be interesting to give the facts in Mr. Pearsall's own words, in a letter to our photographic contemporary. He says:—

In 1873, the gentleman and lady in question in the suit which has attracted so much attention, and which establishes an entire new relation between the photographic artist and the patron, came to my establishment and ordered imperials and cards, photographs of the lady and himself, amounting to thiry-six dollars. At the appointed time I waited on them, and their respective negatives were made, proofs submitted, and all rejected. The rejection of all attracted my attention, as I did not think it possible to fail in making four different sittings; but as I knew the parties to be responsible, the request for a new appointment was granted. They sat, and proofs were submitted, the result as before. Here the gentleman discontinued, having had seven proofs submitted. The lady had two more appointments, making in all ten proofs of her submitted. And here I would add a correction which was current in the public press, that the lady sat seventeen times, which was incorrect. She sat ten times for two styles of pictures, and he seven times for two styles, making in all seventeen times. Now there was but one theory on which this number of sittings was granted to these parties, viz., that they wished to be pleased, and were willing to pay for it. No other theory could have induced me to have granted this number of sittings. At this stage nothing more was heard from either party. As is the custom in my office at various times, a notice was sent to each, requesting a decision. No response was ever made. This I was ignorant of, as it is my custom to officiate in the studio. The office business is entrusted to others, therefore I do not know all the detail or routine of that portion of my business; but when my attention was called to the fact this last summer, I directed that the parties should be notified that if a decision was not sent in within six days, a bill would be rendered for the services and expenses incurred by the seventeen sittings. To this I received an impertinent letter, wherein was stated that nothing was owing me, and that I knew they owed me nothing. I was very much incensed; but believing this party to be a sensible person, but only labouring under a mistake on this question, I decided to take no exception to his letter, but write him a full explanation of the matter, and appeal to his sense of justice, also to him as a gentleman, to settle the matter between us without bringing this young lady's name into court. Unfortunately for the lady, but fortunately for the principle involved, my letter was not accepted in the spirit in which it was written; the suit followed, with the numerous delays and adjournments, till I was wearied and sick of it. Finally the trial came; we claimed twenty-four dollars for the services, time, and materials, and that we had done the best our ability was capable of. If they were not suited, and refused to order the pictures finished, it was no reason why they should not pay for what we had done. They admitted everything, and their only defence was, that they had made a special agreement with our clerk that they should be pleased, or pay nothing. Here the case rested. The judge reserved his decision for five or six days, then gave judgment in our favour for the full amount claimed—twenty-four dollars. The judge's decision was based upon these points: He disregarded their sworn testimony as to the special agreement point, and held that if we did the work artistically, and no refusal to complete the pictures, that we were entitled to a judgment, though they had not taken any pictures. Judge Morse, in giving the time and attention to the question, fully considered the interest of both the public and the artist. At first it might appear somewhat arbitary that people had to pay for what they did not like well enough to take; but the public are the judges of what particular photographic studio they shall visit. Therefore it is entirely a matter of choice just where they shall incur an indebtedness. If the character of the work does not come up to their standard of excellence, they must have selected their artist in the same manner that the fool invests his money on three-card monte, and do not deserve the sympathy of the public, or the right to experiment at the photographer's cost, whether his productions be artistic or otherwise; but such is the precedent established in this case, that he who voluntarily walks into a studio and requests his likeness to be taken, is obliged to pay for the services, time, and material of the photographer, whether they be good or bad, whether he takes the pictures or not. This is the principle I sought to establish, viz.: the public choose their artist, and must pay him.

The case, as we have said, has a bearing on both questions. If it had been the rule in Mr. Pearsall's establishment to pay at the time of sitting, an order to the extent of thirty-six dollars would have been arranged, that amount would have been paid at once, and the only question which would have arisen would have related to the number of sittings necessary to secure satisfaction. But it is doubtless a somewhat difficult thing in many cases to ask for payment before the delivery of goods, and in some establishments would be impossible. Nevertheless, in large cities where the sitters are strangers, it is often a very necessary process. The simplest plan in such cases is for the attendant to fill in and present to the sitter a form of receipt for amount of the transaction agreed upon, treating the payment as a matter of course. Few sitters could take offence at or object to a course of this kind. Of course there are variable circumstances where this plan might not be applicable; but we refer to the ordinary routine of business, where the ordering of a dozen cards or cabinets are the most usual transactions. In the absence of some such arrangement the portraitist, especially in dealing with strangers, is liable, and sometimes subject, to a variety of very specific wrongs, of which that described by Mr. Pearsall is by no means a solitary example. The unscrupulous sitter—and, unfortunately, there are such—may visit studio after studio, sitting until the portrait which pleases his whim is secured. From this one he may order copies; none other of the portraitists ever hearing of him again. Or, worse still—and we have heard of such a case—a dishonest sitter, visiting half a dozen studios, may secure a number of proofs, and pay for none; the wise custom of marking proofs as such failing in some cases to be an efficient protection. The professional portraitist who is familiar with the names, character, and position of most of his sitters is, of course, free from those chances, but the risks of various kinds attendant upon practice in large cities undoubtedly furnish strong argument for the prepayment system.

Where the prepayment system is adopted, the difficulties attendant upon the other question are somewhat modified. But still the question, how many sittings, or how many re-sittings, may a client reasonably demand? is not easily answered. Many portraitists make no limit. Their position is this: "It is our desire and our interest to satisfy our sitters, and hence we would rather incur at times some amount of unnecessary trouble, than send any one away not satisfied. Besides, the knowledge that we are resolved on giving satisfaction often makes the sitter more readily satisfied." The argument is, undoubtedly, a good one on both points; but still it remains a fact that in no other business or profession does such a possibility exist as that unlimited time and material may be expended in pleasing the whims of customers at the expense of the portraitist, all the time, and all the material expended in producing rejected negatives, being absolute waste. In many other industries, it is possible, several essays, only one of which is paid for, may be made before a customer is satisfied; but in no other case, that we remember, is the result of such essay absolute waste, quite unproductive, and incapable of being utilized in any form. There is the wasted time of the skilled operator, who must be paid, whether his work be productive or unproductive. There are the wasted elements: silver, collodion, iron, acids, hyposulphite, &c., the bulk of which are irrecoverable by any process. There is the wasted light, often very precious, in which productive work might have been done. When many sittings or re-sittings are required, these losses make an enormous deduction from the profit of the final transaction, without estimating the occasional loss from dishonest persons who never return to give an order.

The unreasonable multiplication of sittings in order to give satisfaction has been increased to some extent by the facility with which many photographers undertake to produce many negatives for one portrait; sometimes from an anxious desire to please, sometimes in a foolish spirit of competitive cheapness, which is most suicidal. We have repeated illustrations of the latter tendency brought under our attention in the form of tempting advertisements from various studios. It is with us a steadfast principle never to comment upon the commercial management of individual studios, and hence we cannot notice such examples in detail. But we may mention, as an illustration of what we mean, that, in an advertisement before us, card portraits in six positions at eight shillings and sixpence per dozen are offered. It must be a very cheap market in which the chemicals, glass, and labour expended in producing a card negative are not worth a shilling, hence we have the mounted cards supplied at twopence-halfpenny each. Upon this point, however, it is not our business to comment; we rather wish to point out that this readiness in multiplying negatives, from whatever motive, often begets in the public an indifference to the trouble they give, or rather, perhaps, an unconsciousness of the waste they are causing. It never occurs to many of them that in trying different positions, different expressions, sometimes different dresses, to please their own whims, they are doing this at the specific cost of the portraitist. A successful artist once remarked to us, "I never object to re-sits, but I always make one condition, which is often an effective check to the mere gratification of whim: I make it a condition that as the first portrait is so unsatisfactory as to render a re-sit necessary, the negative must be destroyed before the second is taken, as I decline to produce another portrait merely to give a whimsical person a choice of two portraits at my expense. I often find when that condition is explained, the first portrait is not very unsatisfactory after all, and that the sitter prefers retaining it to risking another." This was many years ago, and photographers have become more facile in obliging the public since, probably wisely so; but there is a limit to legitimate concession, of which the temptations of sharp competition too often produce oblivion.

We have no system to recommend, or project to propose. We commenced by saying that these are points in which the judgment of each portraitist must be his guide, each in his own peculiar circumstances, and in relation to his own special connection. But it is perhaps worth while now for members of a profession, the status of which, as many of them think, is not sufficiently maintained, to re-consider how far these matters are most wisely managed in their own establishments, and how far a dignified recognition on their part of the value of their labour and the worth of their productions may conduce alike to the maintenance of status, and the conservation of their commercial interests.

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IMPROVEMENT IN ELECTRIC ILLUMINATION.*

It is well known that the electric light is due simply to the electric current heating the medium it passes through, and the more resistance is offered to the current the greater is the heat developed. The great intensity of the ordinary electric carbon lamp is owing to the badly conducting layer of atmosphere between the carbon points, and the layer being very much heated makes the carbon burn with a white glow. By reason of the great resistance of this layer of atmosphere, which only a very powerful current can overcome, the light must necessarily be a very brilliant one.

It is possible, without the aid of air or gas, to make a solid body quite hot, as, for instance, in the case of a platinum wire; the illumination thus produced is, however, weaker and more uniform, and may be intensified or diminished. But it cannot be applied practically by reason of its great expense, and because, if the heat becomes too intense, the wire is apt to fuse. For this reason, the idea struck Ladyguine to replace the platinum wire with thin bars of graphite or carbon. This graphite possesses, at an equal temperature, much greater radiating properties than platinum. The heat capacity of the latter is twice that of the carbon, so that the same temperature will heat a thin bar of graphite to double the degree which would be attained by a platinum wire of the same dimensions under similar circumstances. Moreover, the electric resistance of the carbon in question is about two hundred and fifty times that of the platinum, and the carbon rod may be fifteen times as thick as a platinum wire of the same length, supposing the current is to give the same amount of heat. Finally, there is no disposition for the carbon to melt, even at the highest temperature.

For these reasons the Ladyguine method of electric illumination may be regarded as a most valuable one, as, indeed, it has already proved to be. The only drawback to it seems to be that the carbon gradually combines with the oxygen of the atmosphere and burns away; but this defect the inventor has overcome by confining the carbon in an air-tight glass, from which the oxygen has been removed in the simplest manner, and replaced by nitrogen.

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ON STRIPPING FILMS FROM THE GLASS PLATE.

BY M. JEANRENAUD.†

Having experimented for some months upon collodion of different kinds, I met with some which presented very great resistance when it was desired to detach them from the glass; half the thickness of the collodion came off with the gelatine, while the other remained adherent to the plate. Many unsuccessful essays thus deprived me of good clichés, but I succeeded in rendering myself master of the difficulty by a means which I recommend to my colleagues whenever they experience it.

After having put the fixed and finished cliché into acidulated water, containing seven cubic centimetres of hydrochloric acid for every hundred of water, as I indicated in 1858, it is withdrawn, dried, and covered with the following solution, which is poured on successively at each angle, and recovered at the opposite one.

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* *Polytechnisches Notizblatt.*

† Read before the French Photographic Society.

Alcohol at 40°	75 cub. cents.
Water	20 ,,
Hydrochloric acid	15 ,,

The cliché is dried again without washing, and is then ready to receive the film of gelatine. The above solution will serve for an indefinite period, especially if the cliché is invariably put into the acidulated water previously, an operation which prevents the alcoholic liquid from turning brown.

To prepare the gelatine destined to lift the cliché from the glass, I have made a little modification which seems to give me a preferable result.

For a plate 27 by 33 centimetres, I recommended in 1868—

Gelatine	20 grammes
Water	100 cub. cents.
Glycerine	4 ,,

(Added after solution).

I now find it well to add to this, forty cubic centimetres of a two per cent. solution of alum. This quantity must not be exceeded, as too much renders the gelatine insoluble and makes it in the form of a paste.

The solution of gelatine should be poured very warm upon the plate, that has previously been warmed. This addition of alum renders the gelatine insoluble, and incapable of decomposing after drying. Moreover, the gelatine has not a tendency to become mildewed, and the cliché on drying takes the appearance of a piece of ground glass, which adds harmony to the negative.

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Correspondence.

ADVERTISING FOR ASSISTANTS.

Dear Sir,—Allow me to trouble you with a few remarks upon a subject which I think worthy of a little consideration from those whom, from time to time, advertise for assistants. It is usual for an employer to conclude an advertisement for a first-class operator with something like the following, viz.: "Send carte of self, specimens, lowest terms, and references, to A. B. C., 13, Such and Such a Place, Somewhere.

Now, in my humble opinion, such advertisements are great mistakes. The advertiser asks so much and gives so little, that answering such anonymous notices is like talking to a man in a mask. I think that more straightforward conduct on the part of the employer would tend to secure a better class of applicant, and consequently save time and expense. Firstly, a man is asked to ticket himself at his lowest price, then to send specimens, and finally to give his references, before he knows if his terms suit; and all this to he does not know whom, as the advertiser hides behind A. B. C. It is bad to ask a man his lowest terms, because you may be sure he will only stay with you till he can get his highest. It is bad to rely upon a batch of specimens as a test of a man's ability, as they are to be bought very easily. But it is mean to expect a man to tell you, so to speak, his history before he knows if he is speaking to a gentleman or a cad. Depend upon it, greater satisfaction would result to both employers and employées, if the former would act more openly in such matters, and say "Messrs. So-and-So require such and such assistance. Terms so much to competent hands." Men would know then how and where to reply, and an amount of confidence would be instilled, beneficial to all parties. Confidence begets confidence, and respect, and even regard, are sure to follow; and I think that employers when seeking assistants should not be ashamed of their names or their terms; and if they are, why then they deserve to get the incompetents in their studios they invariably do get.—I remain, dear sir, yours truly,

Fairplay.

THE COMPARATIVE COST OF CARBON AND SILVER PRINTING.

Sir,—The comparative cost of silver and carbon printing has elicited some amusing expressions of opinion from the profession: some rejoicing that it is more costly, others (like Mr. Bovey) fearing that the incidence of extra cost on the poor photographer would resemble the effect of the last straw upon the back of the proverbial camel.

It may be fairly assumed that with the progress in technical efficiency already made by many operators, prints may be produced in permanent pigments at about the same charges for manual labour as silver, so that the extra cost will be mainly on the materials employed. That these are dearer has been shown by Mr. Bovey; but the importance of this fact may be over-estimated. Assuming that, for a business with moderate prices (say 10s. per dozen for cartes, and double that price for cabinets), the cost of chemicals and materials is fifteen per cent. exclusive of mounting, an increase of one-half more would only bring the cost up to twenty-two and a-half per cent., leaving more than three-fourths profit; and if this is not enough, the increased cost would be more than compensated by an increase of 2s. per dozen in the cartes and 4s. in the cabinets.

The success of autotype so far is due partly to the conscientious desire of the profession for permanent work, and partly to the public demand for this quality; and there is no reason to suppose that the public are not perfectly willing to pay a better price for a better article.

It will be a long time before silver printing is abolished, and the change will necessarily be gradual; but if it could be done away with immediately, and only permanent prints accepted, the laws of political economy would continue to act as they do now.

The outer fringe of the profession, driven by competition to barely remunerative prices, finding the production more costly, would inevitably advance their charges, but would continue in just about the same position as before. The middle ranks would raise their prices sufficiently to recoup themselves profitably for their increased expenditure; whilst those who bring rare gifts of taste and knowledge, or who know how to cultivate the art of self-advancement, will ever maintain a standard of price that is but little affected by a small rise or fall in the cost of the materials. The Autotype Company.

PERMANENCY OF CARBON PRINTS.

Dear Sir,—In your last impression several correspondents assume that carbon photographs are thoroughly permanent. I say that they are not *all* as permanent as they might be. Not long since I had a curly-headed little fellow to sit for his carte, and thinking he would make a good specimen, I had a 12 by 10 enlargement made by the leading firm. The picture was put in a good gold frame, and placed in the window. In a few months after the little fellow fell ill, and the parents, anxious about him, thinking they had better secure the shadow ere the substance faded, came to purchase the picture; and the mother incidentally remarked that she did not think the picture looked so bright as it did some time ago.

I took out the picture from the frame. Judge of my surprise at seeing what had been protected from the light under the matt quite brilliant, and of a purplish tone; but where the light had acted on it gone quite grey and sickly—not the yellow-jaundiced appearance of the silver print, but a greenish-grey, with nearly all the half-tones gone: the chromium salts left in the print, I suppose, will do this, as the printing goes on faintly. Are the operators at large establishments not likely, occasionally, to forget the alum operation; or, supposing it is near stopping time, are there not certain assistants who would "skip" over the alum bath altogether? I happen to know that photographs done in carbon *a la* Swan are all split up, the collodion film having given way. Time only will determine whether or not carbon prints are really permanent. Mr. Bovey may not be so far wrong, after all.—Yours, &c. A. Whitham.

SYPHONS.

Dear Sir,—Allow me to add my testimony to the usefulness of the little syphon described in your last number by Sir Thomas Parkyns.

Just before leaving the neighbourhood, that gentleman gave me one for my negative bath, and I have found it a very valuable adjunct to my dark room.

When using it I adopted a suggestion of his—to decant and filter at the same time, as it runs at just the right pace for filtering. This is easily accomplished by placing the bottle with the filter on a shelf or stand below the bath. I let the tube go to the bottom of the bath, and in that way the sediment, if any, is sure to be drawn off.—I am, sir, yours truly, J. Walter.

Sir,—Reading Mr. Wane's article on emptying baths, &c., in last week's News, reminds me that my way, if not already known, may be acceptable to your readers. Its absurd simplicity is its chief merit, and, like Mr. Wane's, it is not patented.

I use nothing but a thick glass syphon with a small bore. I put the shorter end in the bath as far down as it will go; then, placing the thumb on the outside end—making it air-tight—I take the syphon out of the bath. It will now contain a column of liquid corresponding to the depth of the bath. By turning the syphon down and removing the thumb, the solution will run into each part in equal portions. Now replace the thumb and put the syphon into the bath again down to the bottom; remove the thumb, and the emptying will at once commence.

The above is still more simple if the bath is first filled to within an inch or so of the brim from the stock-bottle. Place the thumb on the outside end first, and then put the syphon into the bath; and, on removing the thumb, the solution will begin to run. The length of syphon should correspond with depth of bath, and, as before suggested, the bore should be narrow.—Faithfully yours, sir, Peter Simple.

BLISTERS—SYPHONS.

Sir,—I have before me a letter headed "Blisters," page 70, last week's News, wherein the writer advises that the hyposulphite fixing solution should be made up a few hours before use. As the letter is without name or address, I fail to see any guarantee to the photographer.

As photographers are, or should be, putting their houses in order for the coming season, allow me to state that the hyposulphite should be dissolved in water as free as possible from air, and but a few minutes before use. This, with the addition of ammonium carbonate, as advocated by Mr. Spiller, makes the most perfect bath for fixing photographs in silver. To obtain the water practically free from air, it is only needed to boil it ten to fifteen minutes, and then pour direct into a stoneware bottle and cork securely, standing on one side till cool. With a part of this water dissolve the crystals of pure hyposulphite, and reserve sufficient to allow of three or four changes of washing water after fixing. I have not time to recapitulate the facts connected with the theory, but can direct your readers to my article on this subject in a former volume of the News.

In the letter on "Syphons," I beg respectfully to call the writer's attention to page 87, Year-Book of Photography, 1872, and to assure him that such articles as he describes have been a usual manufacture of mine for at least ten years, with all sizes and power of india-rubber balls, from simple draw-off syphons to the filtering syphons.—Yours, &c., F. W. Hart.

PLATINUM PRINTING.

Sir,—In your issue of the 4th inst. there are some remarks by "An Old Photographer" on the platinum printing process. These seem to require some explanation which I trust you will allow me to submit to your readers.

Silver does not necessarily enter into the preparation of the paper, although it is generally used as a means of obtaining a quicker and more even precipitation of the platinum. There is no silver in the finished print, which consists wholly of metallic platinum, iridium, and gold.

It must be owing to a misconception of the nature of these prints that any doubt can exist as to their permanency. Photographers can scarcely be so ignorant of chemistry as to believe that platinum black can be attacked by hypo as silver subchloride and oxide are. Hypo is used as the fixing agent because it is the most rapid solvent of the double salt of platinum left in the whites of the prints. Other solvents can be used, but hypo is the quickest; and whatever prejudice may exist against its use in this process, the inventor is willing to wait until experience shall have overcome it.

If "An Old Photographer" wishes to satisfy himself of the totally different nature of these prints from ordinary silver ones, he can do so by applying any or all of the well-known tests that prove so destructive to the latter; or the inventor will have pleasure in showing him the whole process and the application of the tests.—Yours, &c., W. Willis, Jun.

INDIA-RUBBER LINED SILVER BATH HOLDERS.

Sir,—In reply to your correspondent "Bromo," I beg to say that my india-rubber lined bath-holder was suggested by Mr. W. J. Stillman, and made for me by Mr. George Hare, 1, Lower Calthorpe Street, Gray's Inn Road, London. Externally the appearance is that of the ordinary brass-bound mahogany bath-holder, but, instead of containing a heavy glass vessel, is lined with pure sheet india-rubber. In this the solution of nitrate of silver remains quite unaffected, in proof of which I have had a bath-holder for 20 by 16 plates in continual use since 1872, and I have never had any difficulty with the silver bath that could in any way be attributed to the containing vessel.

I am inclined to think, however, that a bath-holder made simply of well-seasoned mahogany of the best quality, the pores of which have been thoroughly filled up with melted paraffine, would be cheaper, and in many respects preferable. It is my intention to have one made, and I shall be happy to report as to how it answers the purpose.—Yours truly, Edward Viles.

Proceedings of Societies.

Photographic Society of Great Britain.

Report of the Council.

In presenting its Annual Report to the Society, the first Council elected under the new rules by a ballot of the whole of the members of the Society has to congratulate them on the material progress which the body it has the honour to serve has made.

During the year which terminates to-night, twelve papers have been read (including that to be read this evening*), one less than the number read in the preceding year; and, though it is to be regretted that an increase has not been made in the quantity, your Council can point to the very great value of the communications made.

At the same time, your Council desires to impress on the members at large the urgent necessity of their use of every effort to support the Society by obtaining an increased amount of original matter to be read before it in the shape of papers, and to point out that, as the Society deals with photography as a whole, there is room for papers on the scientific and artistic aspects of photography, as well as on its manipulatory details, though the latter seem to engage the larger share of the attention of photographers. Numbering in our body, as we do, the most distinguished amateur and professional photographers of the United Kingdom, we ought surely to be able to obtain a larger number of papers.

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* This paper, by Herr L. Warnerke, will appear in our next.

Turning to the Exhibition, your Council can congratulate you on an unprecedented success, and may safely say that never before did the Exhibition attract so much attention from the non-photographic public and the public press. Of the financial aspect of the Exhibition the treasurer will render a favourable account in his report, while of the other aspects the annexed analysis by our Assistant-Secretary, Mr. Edwin Cocking, to whose aid your Council are greatly indebted, will present an interesting view:—

The pictures exhibited were contained in 426 frames, comprising 1,178 different photographs, of which 677 were portraits, 290 landscapes and buildings, and 211 miscellaneous subjects; there were 113 enlargements, consisting of 71 portraits and 42 landscapes. The countries represented are England, Wales, Scotland, Ireland, France, Germany, America, and New Zealand. There are 92 exhibitors, of whom 43 are members and 49 non-members; the exhibitors consist of 71 professional photographers and 21 amateurs; of the 71 professional exhibitors, 33 are members and 38 are non-members; of the 21 amateur exhibitors, 10 are members and 11 are non-members; of the 92 exhibitors, 36 are from London, 50 from the country, and 6 foreigners; of the 36 London exhibitors. 18 are members and 18 are non-members; of the 18 London member exhibitors, 16 are professional and 2 are amateurs; of the 18 London non-member exhibitors, 13 are professional and 5 are amateurs; of the 50 exhibitors from the country, 25 are members and 25 are non-members; of the 25 country member exhibitors, 16 are professional and 9 are amateurs; of the 25 country non-member exhibitors, 19 are professional and 6 are amateurs; there are 18 London member exhibitors and 25 country member exhibitors; 29 London professionals, 33 country professionals; also 7 London amateurs and 15 country amateurs.

Your Council think that the above analysis will show the members the direction in which to seek for recruits for the Society.

Turning again to a pleasant subject, your Council has to congratulate you on our removal to these premises, the use of which for our meetings and exhibitions has been secured, and to express a hope that this arrangement will conduce to the improvement and success of the Society. This will place the Society in a position to guarantee an annual repetition of the Exhibition.

During the year your Council has to record, with great regret, the deaths of their distinguished colleague Sir C. Wheatstone and of Mr. Charles Vignoles (both of them original members of the Society, though the latter was not a member at the time of his decease), Mr. A. Boucher, of Brighton; Mr. Price P. Baly, Mrs. A. C. Palmer, Mr. Winlow, and their invaluable collector, Mr. S. T. Davenport.

The following is a list of papers read during the year:— "Photographic Operations in Egypt, in connection with the late Transit of Venus," by Capt. W. de W. Abney, R.E., F.C.S.; "On a Dry-plate Process for Solar Photography," by Capt. W. de W. Abney, R.E., F.C.S.; "On a method of Enlarging," by Valentine Blanchard; "Photography in Permanent Pigments, with Recent Improvements in Autotype Transfer," by J. R. Sawyer; "On the Comparative Sensitiveness of Various Photographic Processes," by Lieut.-Col H. Stuart Wortley; "The Advantages of Sulphocyanide of Ammonium as a Fixing Agent," by Geo. Hooper; "Note on the Production of Sulphocyanides," by John Spiller, F.C.S.; "On the Manipulation of Large Plates in the Field," by Edward Viles; "On some Photographic Matters," by Lieut.-Col. H. Stuart Wortley; "Action of Eosin on the Photographic Spectrum," by Capt. J. Waterhouse, B.Sc.; "On Photographs taken in connection with the Arctic Expedition," by H. Dixon; "On Investigations relative to the Emulsion Collodion," by Leon Warnerke.

South London Photographic Society.

AN ordinary meeting was held on the 10th inst., Rev F. F. STATHAM (president) in the chair. After the reading of the minutes of previous meeting, the president vacated the chair (which was taken by Mr. WILLIAM BROOKS, vice-president), and read a paper "On Magnitude as an Element of Attractiveness in Photography" (see page 73).

Mr. J. T. TAYLOR thought that their president might not have been aware that portraits of large size had been taken long prior to the introduction of the carte-de-visite. He thought, too, that exception might be taken to that statement in the paper relative to all enlarged portraits that were produced from small negatives being exaggerated, for the contrary was the case, life-lize portraits, when taken direct, being in most cases greatly exaggerated, while those defects necessarily inherent in the production of such portraits were quite absent in enlargements produced from suitable negatives of small size. Lenses constructed on the model of the human eye, and on the large scale suggested in the paper read, would, he considered be quite useless for the purpose intended.

Mr. JAMES TULLEY considered that, owing to its greater sensitiveness as compared with collodion, gelatine might with advantage be utilised in the production of direct large pictures, which at present involved a long exposure.

Mr. BROOKS advocated alkaline pyro development as a means of obtaining a finer deposit of silver in negatives intended for enlargement.

Mr. FOXLEE had for several years previous to the introduction of cartes been in the habit of taking large portraits. He differed from their president in respect to the comparative merits of enlarged and large portraits taken direct. The former were undoubtedly far freer from distortion and exaggeration than the latter.

After some remarks by Mr. Wilkinson and Mr. Statham, a vote of thanks was awarded to the latter gentleman for his paper.

Mr. WARNERKE having exhibited a glass tap which he had found very useful for vessels containing silver solutions and other corroding liquids, the proceedings terminated.

Manchester Photographic Society.

THE monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 10th instant; Mr. W. T. MABLEY, president, in the chair.

Mr. D. YOUNG exhibited an elaboration of Mr. M. Noton's oxygen generator and lantern-stand for producing gas at the same time it is being consumed in the lantern. Mr. Young exhibited, by means of this apparatus, a number of slides of the Polar expedition. He (Mr. Young) said he thought it was admitted that if gas-holders could be made more portable they were very much better than gas-bags. In this apparatus, he thought, this great objection to gas-holders was entirely got over, and many advantages gained, which we could never have had with gas-bags. In the first place, this apparatus occupied only about one-tenth the usual space: it could be put to work in any place where an ordinary chair could be placed, and had also this very great advantage—one person could manage the lanterns, slides, and gas apparatus. One pennyworth of oxygen could be made for enlarging, or a pair of lanterns could be kept supplied for any length of time, and there need never be more than half a cubic foot of oxygen on hand. He had kept oxygen for six weeks, and believed it would keep six months, which, he thought, was not often done in gas-bags. The lanterns (mahogany-covered biunial), four and a-half inch condensers, extra large telescopic brass fronts, one hundred feet of tubing, limes and oxygen mixtures for Society entertainments, and the whole of the gas-holders and apparatus pack in a space of about two feet long and fifteen inches diameter, and could be unpacked and put in working order in four or five minutes, and then occupied only about one square foot. Being on small wheels, it could be moved to or from the screen sensitive surface, which, he thought, would be found very convenient for enlarging. With an apparatus of this size he could supply oxygen sufficient for *four* biunial disssolving lanterns, and he hoped to have one completed soon that would supply *forty*. He had almost forgotten to say the gas apparatus was suitable to any lantern, and he had a special arrangement for the sciopticon which, he thought, would add largely to its usefulness, and only about half an inch each way to its present bulk. This he should be happy to show at a future meeting, if the members desired it. The slides shown were taken by Mr. Henry Dixon, of London, from the 12×10 negatives referred to in the paper he read before the London Photographic Society, and fully reported in the PHOTOGRAPHIC NEWS of January 21, in which he described, in a very pleasant and instructive manner, the difficulties he encountered, and how he got over them.

Mr. WOODWARD exhibited some slides on wet collodion plates, developed with iron, bleached with chloride of copper, and redeveloped with alkaline (liquor ammonia) pyrogallic acid. The colour of these slides approximated to that warm tint so much admired in the Ferrier slides for the stereoscope.

Mr. POLLITT showed some slides produced in the same way as Mr. Woodward's, but blacker in tone, owing to a difference in the time of exposure. Some of Mr. Pollitt's stereo slides were backed with an imitation ground glass produced by coating the back glass with a mixture of iodised collodion and negative varnish. The effect was very good, and much finer than any ground glass.

Mr. A. Brothers, F.R.A.S., V.P., exhibited on the screen (paper) some dozen or more lantern slides from negatives by the late Mr. Breese, and stated that some of the pictures, including water and clouds, were printed from one negative.

A large number of Mr. Coote's excellent lantern slides were then shown, and the proceedings closed with the usual votes.

French Photographic Society.

A meeting of this Society was held on the 7th ult., M. Davanne, vice-president, in the chair.

The Chairman announced that the Minister of Instruction had added the sum of 500 francs to the prize offered by the Society for improvements in the dry process, and, therefore, the prize would be one for 1,000 francs.

The Abbé Verguet forwarded some pictures of the old fortifications of the city of Carcassonne, which possessed great archæological interest.

M. Champion forwarded a note on Carey Lea's method of preparing emulsions for dry plates (see page 77).

One of the members confirmed M. Champion as to the non-success of Mr. Carey Lea's process; he found it impossible by washing to remove the preservative mixed with the emulsion.

M. Chauvigne, of Tours, submitted a collection of photographs of flowers.

M. Thiel submitted some prints in greasy ink by the Andra process.

M. Perrot de Chaumeux presented a copy of his third edition of "Insuccès en Photographie."

M. Dubroni presented a copy of his "Traité Special de Photographie."

M. Perrot de Chaumeux gave a review of the French and foreign journals.

On the question of the bleaching action of aniline colours, M. Davanne observed that the plan proposed, to cover portions of a negative with collodion tinted with aniline, to prevent such portions printing too rapidly, had given him but imperfect results. He prefered to use ordinary lac varnish for the purpose, tinted, if necessary, with picric acid. To remove the dried varnish, where it was not wanted, it was, first of all, moistened with ammonia and water.

M. Perrot de Chaumeux desired to claim for M. Davanne the honour of having first enunciated the theory that certain bodies had the property of absorbing certain coloured rays, respecting which Dr. Vogel had recently secured some data.

The details of the competition for the prize of 500 francs offered by M. Liebert, for a method of curtailing the period of exposure in the wet process, were read.

M. Audoin submitted some enamelled sheet iron baths.

M. Gobert thought it would be imprudent to employ such utensils for silver solutions.

M. Davanne read a note by M. Jeanrenaud, upon stripping films from negatives (see page 79).

M. Arosa submitted some prints in greasy ink, by the Despaquis and Tessié du Motay process. He reminded the members that MM. Tessié du Motay and Maréchal were the first to print from a gelatine block, having exhibited specimens in the 1867 exhibition.

M. Stebbing demonstrated Mr. Willis's method of printing with salts of platinum.

The proceedings then terminated.

Photographic Section of the American Institute.*

The usual meeting was held in December, Mr. D. C. Chapman, vice-president, in the chair. After some routine proceedings,

The Secretary (Mr. O. G. Mason) read a paper from Mr. H. T. Anthony on the use of sulphide of potassium for precipitating silver in old hypo baths (see page 77).

The Secretary read a paper on "Bromide Emulsions," by Mr. T. C. Roche, which has appeared in our columns.

Mr. Roche remarked that he tested his plates for free silver by putting on a drop of iron, when, if there is any free silver, the moment the iron touches the plate it will fog. If there is no free silver present, the iron will not produce much effect, even in the light. He preferred an organifier for emulsions that is soluble in alcohol, and also soluble in water, for the reason that it leaves the film porous. The best organifier he had found was common liquorice, in black sticks, shaved up very fine and put into alcohol—liquorice and hops mixed together. Mr. Roche exhibited a specimen of Anthony's special cotton for making emulsion, and also exhibited transparencies made by the ordinary wet process with the new cotton. They were suitable for lantern work. Lantern slides made by the wet process are usually too opaque.

Mr. J. B. Gardner inquired whether this process would be suitable for line work?

Mr. Roche replied that it would. The whole secret in making transparencies is in the development. As soon as you see your picture come out, stop and wash, and do not wait for detail. These transparencies were flowed with a weak solution of palladium. In photographing, where buildings obstruct the light of the windows, ground glass should be interposed with the ground side out, or the building would throw shades upon portions of the picture. If the ground side of the glass were placed inward, it would show in the picture. Sometimes, in copying negatives, it is well to put a clear blue glass in front of them, which will change the whole colour of the negative.

Mr. E. K. Hough stated that accidentally flowing a saturated solution of cyanide over a negative, it took the varnish off almost instantly without injuring or loosening the film.

Mr. Bierstadt stated that he removed the varnish with caustic potash and alcohol.

Mr. Hough. Perhaps it was the potash, and not the cyanogen, which produced the effect.

Mr. D. C. Chapman. I have had some experience which I can attribute to nothing but acid in the emulsion. I had some good working emulsion, but it was not quite thick enough. I thought I would add a little cotton. I divided it into two parts, and added one kind of cotton to one half, and another kind of cotton to the other half. The next morning, in one of the bottles the emulsion was all in the bottom of the bottle. It had been standing for months before, showing no tendency to settle. In the light it looked like the yellow iodide. In the other it was all good, thick, and creamy as ever. In the first place, all the shaking and coaxing I could apply would not make a union with the collodion, and it was all done by adding the cotton. The only explanation I can give is, that the cotton was acid. The emulsion had been made since last spring, and I suppose the acidity of the cotton liberated free iodine in the collodion, and it went down as the yellow iodide of silver.

Mr. Hough. Where did it get the iodine?

Mr. Chisholm. The bromide of silver is yellow, too, when you let it stand a considerable time.

Mr. Chapman. It may have been the bromide of silver. I do not believe a good emulsion can be made out of an acid cotton. The cotton might be washed with a weak solution of bicarbonate of soda.

Dr. M. N. Miller. I have always been careful, in making emulsion, to keep it in the dark. By mistake, one day, I had it in the light, and supposed it was ruined; but it worked as well as any emulsion I have ever made, and Mr. Chapman informed me that it was his invariable practice to compound his emulsion in the light.

Mr. Chapman. I have let it stand on the mantelshelf day after day, and then, carrying it into the dark room, and flowing it on to the plate, it will not show any difference. If the emulsion stands in a bottle in the sunlight, it will turn brown on the side next the sun, and undoubtedly that portion of it is injured; but it does not penetrate much. A thin coating of it on a plate is impervious to the light, and how deeply could it be affected in a bottle standing in an ordinary diffused light? But it must be flowed on the plate in the dark.

Talk in the Studio.

Preparing Relief Blocks from Photographs.—A German process for getting from photos. surface blocks to be printed by process "letterpress" is:—Take a piece of looking-glass about 2½ inches larger all round than the "original," and pour on it, in the dark-room, the result of one ounce bichromate of potash in fifteen ounces of water, put over a slow fire, and add gradually two ounces of fine gelatine. When dissolved and at boiling point strain through a fine linen rag. The plate must be placed in a horizontal position. Spread all over with a fine broad brush. Give fresh layers till the film reaches about a line and a half thick. Let dry for two or three days, and keep from the light. Take a glass positive from the negative of the original, place the prepared plate in contact with it in the printing frame. Remove to the dark room, pour over tepid water till fully developed. Dry with filtering paper, paint over with glycerine, and wipe off also with filtering-paper. Develop the relief upon the plate; its subsequent treatment need not be effected in the dark. To make the plaster mould, mix fine plaster of Paris with spring water in two vessels, to the consistency of oil in one, thick cream in the other. Hold the plate in the hand, pour over it the thinner solution, tap the bottom side of the plate gently with the hand to prevent air-bubbles. Place the plate horizontally upon the table, and pour the thicker solution over to a moderate height. Leave to settle and dry for some 16½ hours. Cut away the thin edges of the gypsum with a knife. Separate the plaster mould gently from the relief plate. Pour stereo metal into the mould, and a printing plate will be the result. Rectify defects with fine-pointed tools in the plaster mould previously to casting.

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* Condensed from *Anthony's Bulletin*.

A **New Mucilage**.—The *Journal de Pharmacie* states that if, to a strong solution of gum-arabic, measuring 8⅓ fluid ounces, a solution of 30 grains of sulphate of aluminium dissolved in ⅔ of an ounce of water be added, a very strong mucilage is formed, capable of fastening wood together, or of mending porcelain or glass.

New Property of Glycerine.—R. Godeffroy, on examining a chemically pure glycerine from the Apollo Japan Works in Vienna, found that when heated to 150° it took fire, and burnt with a steady, blue, non-luminous flame, without diffusing any odour or leaving a residue. The glycerin had the specific gravity 1·2609. This property enables glycerine of lower specific gravity to be burnt by means of a lamp-wick.

To Correspondents.

A. G.—The carte you send would be considered good work done in any month, although the massive nature of the shadows in some parts suggest winter photography. The border is neat, and the effect good.

Young Photo.—Your letter is too full of personalities to permit of its insertion in our columns.

Spectroscope.—Any properly glazed utensil should resist the action of sulphuric acid and bichromate of potash; common earthenware is often defectively glazed, and this probably accounts for the action you mention. We have not heard of such an instrument for timing exposures; the watch would be far more handy, we should think, than any sounding instrument or stop-clock. The defects you mention in photographs are due more to the lens than to the latter's singleness of vision. If you close one eye a landscape or building changes little in its aspect; but if you photograph with a lens that distorts to any degree, as we know many of them do, a result very different to the real thing is produced.

C. A. M. W.—We should feel inclined to recommend the employment of Warnerke's tissue, but we advise preliminary experiment before adopting it on a tour or a journey. Indeed this advice holds good with all dry plates; each class requires a familiar acquaintance, especially in the matter of development, in order to employ them to the best advantage. We ourselves have secured very satisfactory results both with the Wortley and Liverpool commercial plates.

J. Bainbridge, Barnard Castle.—You are quite right in supposing that the articles "were communicated by the persons whose names are appended thereto."

Comrie.—1. The tissue ought certainly to be more sensitive than silver paper. If you use your bichromate bath strong enough, are you sure you sensitize a sufficient length of time? 2. The alum bath may be used over and over again. 3. We cannot answer third query definitely: carbon prints as perfect to look at as silver ones might with justice be charged more, but we think a double charge would be rather too much.

Argent.—The best plan to turn the precipitate to account would be to part with it to some respectable refiner. If you have it in any quantity, it might pay to reduce it yourself, but only if you have proper crucibles and heating arrangements. It would be hardly worth while to work it up again for use in baths, &c.

Printer.—The sensitized tissue is too damp, or the pressure-frame has been left in a damp position, if the pigment sticks to the film. The damp weather at present is prone to produce the effect you describe. Take care that your tissue is sufficiently dry before it is put into the frame, and if the latter is in a damp place, rub the least quantity of French chalk over the negative film before you put the tissue in contact with it.

Carbon.—We prefer the simple photometer in which a strip of silver paper is exposed to light to mark a degree, to any of the more elaborate ones that have been proposed. Practically it is found that if the instrument is not simple the printer will not use it; as it is, an experinced carbon printer trusts more to his own discretion than to any other aid.

E. C.—The vignette is good; but the other picture is flat and over-exposed.

Young Beginner.—Cocoanut matting would naturally come out very dark in a photograph. A piece of carpet or drugget of undecided pattern would answer best. 2. Try a weak solution of cyanide of potassium, five or six grains to the ounce of water; watch its action, and wash off as soon as it has proceeded far enough; you must not hope, however, for a very satisfactory result.

Photochromes.—We have not seen any of M. Vidal's recent work, of which our French Correspondent has spoken, so we cannot give an opinion on the merits of the process as it now stands.

H. A.—1. There is sometimes much trouble, as we know, in removing the yellowish tint from the bichromate. All we can recommend you to do is to allow the print to remain in cold water, and also thoroughly wash under a rose; if canvas once gets impregnated, however, with the yellow tint there is hardly any means that will remove it again. 2. Do you think the worm marks are inherent to the paper? Let some freshly sensitized paper be tinted in the sun, not under a negative, and see if the marks are produced then on toning and fixing. The recent damp weather may have something to do with it.

J. H. W.—The coffee process has always been a favourite one of ours. The plates keep very well and develop cleanly, but they are not quite so rapid in their action as others. The pictures you forward are, for the most part, very fine, and we think you prove yourself an adept in dry plate photography. That some of the plates were prepared fourteen months speaks highly for their keeping qualities. St. Pierre and Ouchy are charming pictures. The cedars and plants are a little over-developed in the high lights, a point difficult to avoid sometimes with dry plates.

Hope.—You are employing your waxing compound too thick, and using too much of it. We should advise you to add more turpentine, and apply the waxing solution to the glass as you would collodion, instead of rubbing it on. If rubbed on, use a clean rag, not leather. There is no plan of cleaning the margins that we know of; they may not be absolutely white, but they should not be dirty. Your transfer paper is not fine enough, perhaps.

*** Owing to an unusual pressure on our space this week many articles and several letters are compelled to stand over; one or two of the letters which we publish have been condensed for the same reason.

Boxwood, A. F., and many other correspondents in our next.

METEOROLOGICAL REPORT FOR JANUARY.

BY WILLIAM HENRY WATSON.

Date.	Barometric Pressure.			Temperature			Direction of Wind at 9 a.m.	Remarks.
	Morning	Noon.	Night.	Morning	Noon.	Night.		
1	29·68	29·70	29·78	39°	40°	32°	S.W.	Fair, but gloomy
2	29·78	29·68	29·58	35	38	40	S.W.	Heavy showers p.m.
3	29·64	29·73	29·80	44	46	46	W.	Fair, but gloomy. Foggy.
4	29·80	29·90	29·92	46	46	45	W.	Fair, but gloomy. Foggy.
5	29·92	30·00	30·04	42	44	40	S.	Fair and bright
6	30·05	30·10	30·17	41	44	33	S.S.W.	A little snow this afternoon
7	30·19	30·05	29·93	34	35	35	S.W.	Sleet this evening. Windy
8	29·87	29·80	29·70	32	32	22	N.W.	Snow a.m. and p.m.
9	29·68	29·67	29·73	24	31	28	N.W.	Fair, but gloomy
10	29·90	30·00	30·00	32	—	35	N.	A little rain this morning
11	29·92	29·94	29·93	36	35	28	S.W.	Fair and bright
12	29·90	29·80	29·72	28	34	38	W.	A little snow p.m.
13	29·90	30·00	30·16	36	37	35	N.W.	Fair, but gloomy
14	30·21	30·20	30·28	33	35	32	N.W.	Fair, but gloomy
15	30·43	30·45	30·30	33	33	30	N.	Rain a.m. and afternoon
16	30·00	30·05	30·00	26	34	36	W.	Misling rain at night
17	29·98	29·87	29·59	33	41	40	W.	Rain a.m. and p.m.
18	29·61	29·66	29·70	44	46	45	S.W.	Fair, but gloomy
19	29·75	29·70	29·60	42	46	46	S.S.W.	Rain this morning
20	29·51	29·43	29·32	41	44	42	S.S.W.	Rain a.m. and p.m.
21	29·32	29·83	29·40	38	39	32	W.	Rain this morning
22	29·57	29·60	29·70	30	36	33	S.W.	Fair, but gloomy. Foggy
23	29·82	29·86	29·90	38	40	40	S.S.W.	A little rain this evening
24	—	—	30·14	47	50	46	W.S.W.	Rain a.m. and p.m.
25	30·10	30·03	29·95	38	42	41	W.	Fair, but gloomy
26	29·91	29·92	29·97	38	45	46	S.W.	Fair, generally bright
27	29·98	30·00	30·00	44	45	44	S.W.	Fair, but gloomy
28	29·90	29·93	29·98	44	46	38	S.W.	A little rain a.m. and p.m.
29	29·99	29·80	29·90	40	45	38	S.W.	Fair, generally gloomy
30	29·90	29·84	29·86	40	44	49	S.S.W.	Rain all day
31	29·93	29·93	29·97	46	49	46	S.	A little rain this morning

Summary.	Mornings.	Noons.	Nights
Highest temperature observed	47° ...	50°	... 49°
Lowest ditto	24 ...	31	... 22
Mean ditto	37·5+	40·8—	...38·0

Mean of whole observations ... ... 38·7+

Highest barometric pressure observed during the month was 30·45

Lowest barometric pressure observed during the month was 29·32

Number of days on which rain fell 17

Number of fair days 14

Fair days on which it was gloomy 11

Fair days on which it was bright 3

The Photographic News, February 25, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Electric Light at the Chemin de Fer du Nord.—Scientific men have not yet given up the attempt of lighting our streets and public buildings with electricity. When Sir Humphry Davy first exhibited the electric light in this country, at the Royal Institution, Albemarle Street, at the commencement of the present century, using for the purpose a gigantic battery of four thousand metal plates, it was generally anticipated that the time was at hand when we should have our railway stations, tunnels, squares, and the like, illuminated by means of the electric spark. But the matter turned out more difficult than it was at first supposed. Not only was there an enormous battery power necessary to generate continuously a current sufficient for the purpose, but a second difficulty presented itself in the fact that the light could not be maintained constant and uninterruptedly. Unlike most sources of light, there is no combustion going on in the electric light; two carbon points are approached to one another, and it is the electric current in passing from one to the other which causes the brilliant piercing illumination to which we are accustomed, the resistance afforded by the atmosphere to the fluid augmenting the brightness of the light. These carbon points do not burn away, but something quite as aggravating takes place. Particles of charcoal leave one of the points and become deposited on the other, shaping the latter by degrees in the form of a cup, and altering the distance between the two points. It is this vexatious phenomenon which has mainly stood in the way of our employing the electric light, for this is consequently obtained only in a fitful manner, under the circumstances, thus preventing any reliance being placed upon it for a length of time. Of late years the first difficulty to which we have alluded was successfully overcome by making use of Faraday's discovery, and employing a powerful magneto-electric machine for the development of the electricity, and it was when we had got so far that photographers made an attempt to employ the electric light for their purposes. Disderi was one of the first to put up one of these electric lights in his printing-room, and both the Woodbury Photographic Relief Printing Company, as also MM. Goupil et Cie., of Paris, have had recourse to this kind of artificial illumination in the production of photographic results. But the difficulty of obtaining a constant spark in these cases was also the great drawback; and no doubt the use of such lights would have been continued in photographic ateliers had it not been for this, although at best it is but a poor substitute for sunlight; for as many hours, almost, are necessary to produce a result with the electric lamp as minutes are required with good sunlight at one's disposal. Many years before photographers turned their attention to the electric light it was experimentally employed for illuminating purposes. Thus the Palais Royal Theatre in Paris was for some time lighted by means of electricity in 1848; and subsequently, it will be remembered, Dr. Watson illuminated the works of Westminster Bridge by the same agency, thus permitting work to be carried on uninterruptedly during the night as well as day. At the Houses of Parliament the electric light has been used for illuminating the spire; and now that large gas jets, even of the most improved character, have taken its place, the beacon that once shone so brightly can hardly be seen a couple of miles off through the smoke and mist of London. At the South Foreland Lighthouse two electric machines, worked by means of small steam engines, were fitted in 1859, and we believe they are used to this day, although the uncertainty of the light makes it necessary to have the ordinary lamp apparatus ready for use in case of accident. The electric spark in this case shines across the Channel half as far again as the best lighthouse beacons, and may be seen at a distance of thirty miles on a fine night as bright as a star of the first magnitude. The news now comes to us from Paris that the Northern Railway Terminus in that city—with which, by the way, all travelling Englishmen are acquainted—is to be lighted up in future with four electric lamps. These will replace four hundred gas jets of one kind and another that are kept burning about the station, the four lamps being placed above the nave, which resembles that of our Cannon Street Station, and is about six hundred feet long. The workshops of the same company situated at La Chapelle are also to be lighted by the aid of ten similar lamps, while the Paris, Lyons, and Marseilles Company are going to see what can be done with the electric light for illuminating some portions of their permanent way. It will be a great stride onwards if we can thus make use of the electric light for the purposes of everyday life, for it is certainly very strange that after all these years no inventor has been able to devise a simple and certain means of illuminating by means of electricity. It is only recently that a project was made to get the electric fluid, instead of passing through the air between two carbon points, to travel through a short length of some newly discovered alloy, which, by resisting the electric current, became heated to a far higher degree of whiteness than platinum, while at the same time it had not that tendency to fuse when made white hot. If experiments have been successful in showing that such a material does exist—one which gives out great light, while at the same time it is not destroyed—the old difficulty about the inconstancy of the electric light is at once removed, and there will be little difficulty in securing a cheap and effective electric lamp. It is very possible, we think, that the renewed efforts on the part of our French neighbour are due to a discovery of this sort, and it will be a great boon for civilised nations when they have their lighthouses, railway signals, and other important beacons furnished with electricity, and all public buildings, streets, and squares are lit up by the electric spark.

INVESTIGATIONS RELATIVE TO THE EMULSION COLLODION.

BY LEON WARNERKE.*

Having made a promise to give some account of my experiments with gelatino-pyroxyline after Colonel Stuart Wortley's formula, I bring before the meeting the result of my observations relative to some substances used in the preparation of collodion emulsion.

The use of the collodion emulsion is now very extended; nevertheless its preparation is still uncertain, and the theories in explanation of its details apparently so contradictory, that the conclusion is not unnatural that the question of collodion emulsion is not yet exhausted; and this is my excuse for adding a few observations on the extensively practised, but not yet quite understood, process of emulsion photography.

I believe that, of the different formulæ for collodion emulsions, washed collodion emulsion is the one that offers the greatest advantages; and all my remarks are relative to that system.

It is a recognized fact that pyroxyline prepared at high temperatures is necessary for making collodion emulsion. It confers two important qualities—porosity of the film, and intensity by a single application of the alkaline developer, or an easy intensification by pyrogallic acid and silver; but when the emulsion possessing these precious qualities is washed, dried, and again re-emulsified, the resulting thin image proves unmistakably that the high temperature pyroxyline, though good for simple emulsion, yet requires some improvement for washed emulsion.

When, some time ago, Colonel Stuart Wortley communicated to me his plan of gelatinizing pyroxyline, I immediately tried it, and very soon became convinced that the addition of gelatine supplied a much-desired want.

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* Read before the Photographic Society of Great Britain. This paper has been revised by the author.

My *modus operandi*, according to the Colonel's formula, is the following:—100 grains of the finest cotton-wool are put into a porcelain jar, and 30 grains of gelatine dissolved in the smallest amount of hot water, are added. By pressing it with a wooden stick, all the cotton will be uniformly impregnated. It is subsequently very thoroughly dried before the fire.

Nitric acid (sp. gr. 1·450)	...	4 fluid ounces
Water	...	12½ drachms
Sulphuric acid (sp. gr. 1·840)	...	6 fluid ounces

are mixed in the order named. An arrangement is provided to keep the temperature of the mixture uniformly at 158° Fahr. The dried gelatinized cotton, weighing now about 130 grains, is immersed in the mixed acids, and left in, twenty minutes. After the lapse of this time the acids are pressed out, and the pyroxyline quickly transferred to a large vessel of water. Washing and drying follow. Colonel Stuart Wortley recommended also a second mode. Gelatine, instead of being added to the cotton, is dissolved in the water figuring in the formula of the acids, and ordinary dry cotton immersed in the mixture of gelatinized acids. In my experiments I found that a considerable quantity of the acids was left from the first experiments. I added to it 3 fluid ounces of sulphuric acid, and immersed in this new mixture, keeping it at 158°, 50 grains more of dried cotton. Supposing that, some gelatine being dissolved from the first immersion, it would give me a result approaching to the second of Col. Wortley's formulæ. The weight of the pyroxyline No. 1 was 130 grains, an increase of 30 per cent.; it was not powdery. Ordinary cotton, under similar conditions, decreases 5 to 15 per cent. in weight, and is extremely powdery. The new pyroxyline dissolves perfectly in sulphuric ether (sp. gr. 0·720) alone; it partly dissolves in hot methylated alcohol (sp. gr. 0·815). In equal proportions of ether and alcohol it is soluble without any residue. [illegible]ution of ten grains pyroxyline per ounce of solvent is quite fluid, and the film produced rather strong. The colour of the collodion in a large bottle, unlike ordinary, which is yellowish, is now a whitish opal. The gelatinous precipitate occasioned by the addition of aqua regia is more difficult to redissolve than in ordinary collodion.

For comparative trials, bromo-iodo-chlorized emulsions with excess of silver, and bromized with excess of bromides, were prepared from the new and five other samples of pyroxyline. Before washing, a remarkable increase of intensity and sensitiveness was obtained in the gelatinized emulsion. After washing, the difference was less striking, but still sufficiently marked to prove the new pyroxyline to be a very decided improvement. Sample No. 2, from the remaining acids, was more powdery, but gave negatives less intense.

The strength of the acids is of paramount importance in the manufacture of pyroxyline. Unfortunately, they cannot be supplied of uniform specific gravity, and the hydrometer must be used for ascertaining the actual strength.

The following table by Parkes, giving the variation of density at different temperatures for sulphuric acid, will be found of great utility:—

Temp. Fahr.		Sp. gr.
42°	... ...	1·8520
44	... ...	1·8522
46	... ...	1·8519
48	... ...	1·8517
52	... ...	1·8511
56	... ...	1·8500
60	... .	1·8468
63	... ...	1·8449
68	... ...	1·8435
70	... ...	1·8430
74	... ...	1·8413
80	... ...	1·8381
84	... ...	1·8343

I could not put my hand on a similar table for nitric acid.

To enable the experimentalist to use acids varying in specific gravity from that given in the formula, two other tables of Dr. Ure's, giving the amount of anhydrous sulphuric and nitric acids in hydrates of different specific gravities, will be of use in calculating amounts of such acids to suit any given formula.

Amount of Dry Acid in 100 *Parts of Sulphuric Acid.*

Sp. gr.		SO_3		Boiling point.
1·8485	......	81·54	......	620°F.
1·8475	......	80·72		
1·8460	......	79·90	......	605
1·8439	......	79·09	......	590
1·8410	......	78·28	......	575
1·8376	......	77·46	......	560
1·8336	......	76·65	......	545
1·8290	......	75·83		
1·8233	......	75·02	......	530
1·8179	......	74·02	......	515
1·8115	......	73·39		

Amount of Anhydrous Nitric Acid in 100 *Parts of Nitric Acid of Various Specific Gravities.*

Sp. gr.		N_2O_5
1·5000	....	79·700
1·4940	....	77·303
1·4850	....	74·918
1·4760	....	72·527
1·4660	....	70·136
1·4570	....	67·745
1·4460	....	65·354
1·4346	....	62·963
1·4228	....	60·572
1·4107	....	58·181
1·3978	....	55·790

It is strange that nitric acid of sp. gr. 1·450 is in all the photographic formulæ, invariably, recommended to be afterwards diluted with water. Nitric acid of sp. gr. 1·450 is rare, expensive, and unstable. Of all the hydrates of nitric acid. the most stable is that of sp. gr. 1·42, distilling at 123° Cent., and having for its formula $NO_5 4HO$; it is also easily obtained commercially, and at a price one-third of the former. The above-stated formula, with the aid of Ure's Table, will be:—

	SO_3	NO_5	HO
48 drachms sulph. acid, sp. gr. 1·840 ...	$\frac{78 \times 48}{100} = 37·44$	....	$\frac{22 \times 48}{100} = 10·56$
32 drachms nitric acid, sp. gr. 1·450 ...	....	$\frac{67 \times 32}{100} = 21·44$	$\frac{33 \times 32}{100} = 10·56$
12½ drachms water	....	....	12·50
	37·44	21·44	33·62

Same formula with nitric acid of sp. gr. 1·420.

	SO_3	NO_5	HO
48 drachms sulph. acid, sp. gr. 1·840 ...	$\frac{78\times48}{100}=37\cdot44$	....	10·56
35½ drachms nitric acid, sp. gr. 1·420 ...	....	$\frac{60\times35\cdot5}{100}=21\cdot30$	14·28
9 drachms water	....	....	9·00
	37·44	21·30	33·84

I complete these remarks on pyroxyline by mentioning that some time previously I found that pyroxyline giving extraordinary density can be prepared from the raw hemp; and I suppose that the mucilage cementing the fibres, and in many respects resembling gelatine, is the acting agent, performing the very same function in the pyroxyline. Collodion from hemp-pyroxyline is red in colour, and very fluid; but the insoluble deposit is very considerable; it also requires stronger acids. It is worth remarking that the strength of acids must vary with different samples of fibres, even in the case of different cottons. I also prepared very good pyroxyline from Whatman's hand-made paper, which, being sized with gelatine, offers a ready-made material, suitable for making gelatinized pyroxyline. (*To be continued.*)

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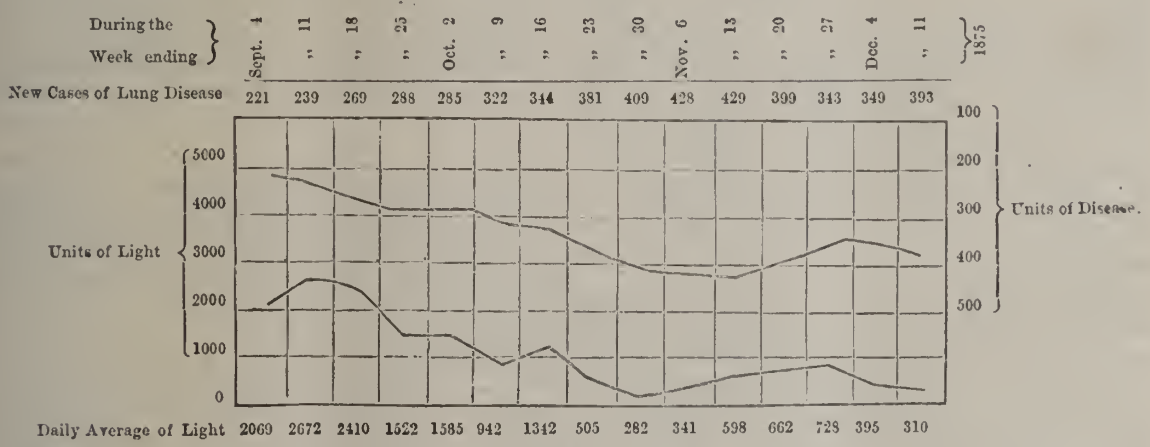
DARKNESS AND DISEASE.

BY D. WINSTANLEY, F.R.A.S.*

It has long been suspected, and even confidently asserted, that there is an intimate connection between darkness and disease, and, indeed, many evidences have been adduced which amply justify the allegations. So far as I am aware, however, no direct experimental evidence has been adduced which indicates the closeness of this relationship, and for the very satisfactory reason that until within the past few months no instrumental means have been employed by which the aggregate quantity of the light of day could be satisfactorily arrived at and accurately expressed; these means, as you are aware, I have, fortunately, had the honour to devise, and I have already submitted to your Secretary diagrams showing the daily variations in the quantity of light radiated from the southern sky.

I have recently made a comparison of my figures with those of the Manchester Officer of Health, and the result is, that I have obtained a confirmation of the alleged relationship between darkness and disease, in so far, at any rate, as concerns disorders of the lungs. You will see, on reference to the diagram, that the number of new cases of lung disease varies, not exactly, but substantially, with the variations of the light; being greatest when the amount of light is least, and *vice versa*; that is to say, the line graphically representing the variations of disease is, in effect, parallel with that representing the variations of the light. Were the two lines absolutely parallel, the inference would be that lung diseases were produced by variations in the light, and by these alone, or that the variations in each were directly dependant on one and a common cause. This, it could be expected, would prove to be the case, as variations in the temperature and in rainfall must both tell on the numbers of diseases of the lungs. My diagram, I think, will satisfy you that whatever may be the immediate and total causes of lung disease, they are very intimately connected with the variations of the light.



I have good grounds for the opinion that mental maladies and derangement of the nervous system vary in their intensity with the variation of the light; and I trust shortly to be able to submit figures by which this will be conclusively made out.

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NOTES FOR A SHORT TOUR IN BELGIUM WITH THE CAMERA.

BY JOHN LESSELS.*

Bidding good-bye to Ghent, we take our tickets by the Pays Bas Railway to Antwerp. An hour brings us to the river side, and in five minutes we are across the Scheldt and in Antwerp. An omnibus being waiting, we go on, and in ten minutes more are set down in the Place

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* Read before the Yorkshire Photographic Society.

* Continued from page 77.

Vert at the door of the Hotel de l'Europe, where we shall find in Mr. Barber a kind landlord, and a house full of English people all either going or returning on their continental tour; and here also are to be had all the English newspapers of the day, with an occasional stray copy of the *Scotsman*. From the window of our bedroom there is an excellent view of the spire of the cathedral, four hundred and ninety-two feet in height, towering above everything around it. This is said to be the model on which the gifted Thomas Kemp formed his idea of the Scott monument, and he could have found nothing finer. It will take two days to examine all that is to be seen here, even in the most cursory manner; but the cathedral, both exterior and interior, is the first in prominence, as many and varied views may be taken of both; and when here we must see Reuben's three famed pictures of the Crucifixion.

Behind the cathedral is a draw-well with a handsome Gothic canopy of wrought iron, the work of the famous blacksmith painter, Quentin Matsys. Passing that, along a narrow street, we enter the Grande Place, one side of which is occupied by the Hotel de Ville, a plain but imposing structure, the marriage chamber and some of the other rooms being well worthy of a visit; one in particular having the walls covered with large pictures by the late Baron Leys, but which, in my opinion, do not add much to his fame. On the other sides of the square are some richly decorated Flemish houses six and seven storeys high, and very characteristic of the style. Some of these formed what we would term the Guild Halls of different trades (as Le Maison des Charpentiers, Le Maison des Drapiers), and are very highly ornamented. Passing through from the north-east corner of the Place along a winding street lined with similar houses as we have described, we pass a curious lofty turreted building which is another hall, and is called La Halle à la Viande. This was the butcher's hall. We now enter Le Marché au Betial, a large square, at one end of which is the church of St. Paul, which, with a very plain exterior, presents a noble and finely-proportioned interior, very rich in paintings by Rubens and Vandyke, and the whole walls covered with the finest and most elaborate oak carvings to the height of about ten feet, presenting every variety of subject, both religious and profane, with confessionals in each bay, having full-sized statues of apostles and saints on each side, of the most exquisite workmanship, by the famed artists the Quellins and Vanbrugen. Each compartment or bay would form a picture of itself, and the whole combined a perfect treasury of design for carvers and modellers.

Leaving the Place, we glance in at an open passage, and find in what is now used as a common stair a most beautifully carved oak stair railing representing the wine press at work, and all the tools used in the cooper trade very fancifully worked in with the elegant scroll-work that surrounds it, which marks it as having been the Guild Hall of that trade. Passing up the Rue des Saucisses, with its fine old timber-fronted mansions, we arrive at the site of the old fish market, some quaint towers of which still remain. We pass under an open archway, and are in front of the old Inquisition House, with its dungeons much more terrible in their dark and dampness than either those of Chillon or Venice. The façade of this is very picturesque, with its arched portal and corbelled oriel window, and forms a good picture. The interior is now used as a museum of local antiquities. A hundred yards from this is the quay, with a forest of vessels on the river; and the quay itself so littered with goods from want of proper storage as to make it difficult to pass at times. From here, looking along one of the streets, we have one of the finest views of the cathedral. Returning again by the Place Vert, we go on to the Place de Mer, where the Royal Palace is placed; but turning through a short cross street brings us to the Bourse, which has only lately been rebuilt since destroyed by fire, and which is well worth a visit; passing through it, we emerge into the Longue Rue Neuve, and a short walk brings us to the church of St. Jacques. The exterior of this has been much defaced, with additions in the Renaissance style totally differing from the original work, and presents a very strange mixture, particularly the west front. The interior is, without exception, one of the best proportioned in Belgium. There are double aisles on the east side of the transepts, and the general view from the nave eastwards is very fine; but the first glance tells us that we have got a very difficult subject, from the great variety of colouring in the marble screen and other decorations, including the dark oak elaborately carved pulpit. Yet, nevertheless, a dozen of different negatives may be taken, all making good pictures.

The famous Sir Peter Paul Rubens is buried here in a chapel behind the grand altar, in which there is a large picture of himself and family, considered one of the finest of his works. Among the other pictures which the church possesses is a fine picture, by Vandyke, of St. George and the Dragon.

Leaving St. Jacques, and returning by the Longue Rue Neuve, in what is now a private mansion, but once the residence of the Duke of Burgundy, on application to the present proprietrix, a sight is obtained of the richly decorated private chapel with its stained glass windows and walls emblazoned in colour with the family genealogical tree of that illustrious nobleman, the branches being hung with shields of arms intermixed with birds in a very beautiful and fanciful manner; the richly groined ceiling is also decorated in colour in the most exquisite taste.

Between this and the cathedral, in a quiet square, is the church of the Jesuits, built in the style of the Italian Renaissance, with some good points in the interior; but no Scotchman should leave Antwerp without seeing the church of St. Andrew. The elaborately carved oak pulpit represents the call of the apostle, who, with his companions, all life size, are standing in a boat, in which the cordage of the nets and the fishes are all carefully worked altogether. It is a most wonderful piece of sculpture; and on one of the pillars near it is hung an original portrait of Mary Stuart, the ill-fated queen of Scotland, said to have been presented to the church by one of the three Marys, her maids of honour.

For a little change, we must take a day at Lierre, which is only twenty minutes by rail. The principal object there is the church of St. Goemaere, the interior of which is particularly fine, the rood screen of itself being well worth a long day's journey to see, with its black marble shafts and foliated arches looking like petrified lace, they are so richly and delicately carved. Three or four excellent pictures can be got here, and also some picturesque bits in the town.

Before leaving Antwerp we must take one day at the "Musée," or picture gallery, being one of the principal attractions of the town, as it contains some of the finest works of Rubens, Vandyke, Jordains, Snyders, with a host of others of the most celebrated Flemish and Dutch painters; and in the vestibule or staircase a series of paintings by Baron de Keyser, representing the progress of the fine arts in Belgium. These are of colossal size, and with all the elegance of design and correct drawing of the best of the old masters, they possess the further charm of that richness of colour belonging to the best period of the Flemish school, and will stand comparison with any work of modern times, either French or German; in fact, they are well worth a journey from Edinburgh to see of themselves. Besides which there are several private galleries worthy of a visit.

Having completed our work in Antwerp, we shall proceed to Brussels, which is only an hour's journey. From the station is but a short journey to the Rue Neuve, where we shall find comfortable quarters at a reasonable cost in the Hotel l'Univers.

So much of the old part of Brussels has been pulled down within these few years that the most picturesque parts are gone and replaced by handsome modern buildings, which, although fine in themselves, are not good subjects for the camera, if we except their New Bourse in the Italian style, which is very fine. We have, however, some noble specimens of the old Flemish architecture in the buildings in the Grande Place, and, besides these, the magnificent Town Hall. Then there is the interior and exterior of the cathedral, both of which are fine; the west front being so much elevated above the adjoining ground has a most imposing effect, and is well worthy of a close inspection. There are also some of the public fountains and monuments that will make good pictures. But taking Brussels as a whole, although a magnificent city, it has far fewer picturesque objects than the old town of Bruges; yet there is much to gratify the stranger in their noble streets and boulevards with the drive to the Forest of Soigny; the interior of the Palace is also worthy of a visit, and the picture galleries including the Wiertz Museum.

Close to Bruxelles is Louvain, which will well repay a day's time. First, there is one of the largest and finest of Town Halls, and next the interior of the church of St. Gertrude, and some other things, all of which could be easily accomplished within the day, and return to Bruxelles in the evening.

Hitherto our movements have been all in a forward direction; now we must begin to retrace our steps homewards, and our first move will be to Courtrai; but this, with some of the neighbouring towns, we must leave to a future opportunity.

If your time permitted, it would give me great pleasure to tell you of the many acts of kindness I have received at the hands of the people during my wanderings amongst them, and the ready permission I always met with in asking admittance to see the interiors of some of the buildings, both public and private, where I knew there was something of interest to be met with; and have often been ashamed of myself on account of the great trouble they took to accommodate me, in permitting me to sketch or photograph things I desired; so that all my remembrances of Belgium are of the most pleasant description.

SPOTS UPON ALBUMENIZED PRINTS.

BY M. A. DAVANNE.*

About a year ago I called the attention of the Society to those multitudinous spots which are such a source of trouble and expense to those who still print by the aid of silver salts. The importance of the subject will, of course, become less as carbon printing is introduced more and more into our studios, but, *en attendant*, it seems to me that the matter is one very worthy of our notice. For this reason I ask the permission of the Society to make known some new facts, which seem to confirm the observations I made upon this subject last year.

At that time I remarked, after having made numerous experiments, that one of the principal causes for the spots, when they are observed in large numbers, either in the form of constellations or in regular or irregular waves, were the presence of invisible metallic particles adhering to the back of the sheet; these particles came, probably (I said), from the manufactory itself, and, more probably still, from the glazing between the sheets of metal.

One of our French factories has not hesitated, by reason of this opinion, to change the method of glazing adopted, and has substituted for the plates of copper and zinc hitherto employed the method of calendering between cylinders. A certain quantity of paper thus prepared has been submitted to me, and I have tried each sheet successively. Not one of them presented the defects of which photographers have complained so much, while essays made with the paper previously manufactured—excellent in other respects—proved it to be so covered with such spots that a very large number of pictures printed upon it had to be rejected. Under the conditions in which they present themselves chemical analysis is impossible, for the particle of metal is so minute that it escapes detection, even with a strong magnifier; and it would be extremely difficult to subject the whole surface of a sheet to microscopical investigation. Another method (less rigorous in its nature, it is true) may be substituted for analysis; I mean synthesis, by means of which it is possible to produce the same spots under certain conditions; and it is this method that I have had recourse to.

My re-agents were of the simplest kind. I prepared a sheet of very fine emery paper, and the surface of a copper plate was gently rubbed against it, so that it retained a few particles of that metal. Further, I had a sheet of ordinary paper upon which I put a little of the grease which escaped from the bearings of my press. The two sheets were then carefully cleaned so as to leave no soil upon the hands that touched them. I took either one or other of these papers, applied it to the back of a sheet of albumenized paper, and then, with any handy body, made a few marks. The paper under these circumstances leaves almost inappreciable metallic traces; but when the sheet is sensitized, and it is further treated in the various photographic operations, the result is to impart to the sensitized surface white spots, which reproduce all the marks or lines that were made at the back.

If you now examine the back by means of a magnifier, or with the naked eye, all those black points are to be seen which we complain of in albumenized paper, and which we have indicated as the cause of the spots. It is but reasonable to suppose, therefore, that the same result is due to the same cause.

We have also received some fragments of sensitized paper presenting on the back straight lines of a brownish tint; these are evidently due to a reduction of the silver, but, contrary to our expectations, the marks in the subsequent operations disappeared either totally or partially. An examination by means of a magnifier demonstrated that most frequently when the line remained white upon the spot, it was also slightly visible in black from the back, and thus we recognise the metallic particle reduced by silver. Whenever the lines disappeared on fixing and washing, there were no lines at the back.

The appearance of these lines was somewhat greasy; we tried, accordingly, what would be the effect of the contact of pure oil, and we have been able to prove that a trace of greasy matter at the back of a sensitized sheet does not fail to act as a reducing agent, and appears at the back of a brownish colour. But this tint disappears in the following operations, while, on the contrary, it remains and becomes visible, even on the sensitized face, if the paper remains long in the sensitized condition, and has been overlooked, or the oil contains a little metal.

It seems easy, after these experiments, to explain by these infinitely small particles all the series of spots which are the bane of the photographer and the manufacturer. They may be said to be due to an excess of care. It is probable that in the large factories of which we have spoken all the metal surfaces, large cylinders, metal plates, &c., are taken great care of; but the rags employed for cleaning them are doubtless not free from metallic particles, and it is certain that they are greasy. Therefore, however cautious the workman may be, it is impossible for him to prevent accidental grease remaining in some uneven part of the metal, in a defect in the surface, or what not; and the deposit of this grease in circular curvings upon the surface would easily give rise to the regular and irregular markings one sees upon the paper from time to time.

Therefore we repeat once more that the metallic particle is one of the greatest plagues of the albumenized print producer. The manufacturer ought to be on his guard against such defects, and it behoves him to take the greatest care in suppressing them.

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* *Bulletin de la Societe Francaise.*

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THE DIFFICULTIES OF CARBON PRINTING.

If other proof were wanting, our column to "Correspondents" shows plainly enough that a vast number of photographers are occupying themselves with carbon printing. Half the letters that reach us just now bring requests for some information respecting printing in permanent pigments; and there is scarcely any manipulation and aspect of the process upon which we have not been desired to give our opinion or advice. Unfortunately, most of our correspondents have chosen a most unfavourable season of the year to commence their experiments with a strange—and by no means easy—process; but it is no doubt for the very reason that the dull weather gives them so much leisure, that they have been enabled to spare time for battling with the process.

The subjects upon which information is asked for by our correspondents include well nigh the whole range of the manipulations to be undertaken in carbon printing; and it would be simply impossible, therefore, to satisfy every one of the querists. That the production of portraits in carbon is no easy matter, our correspondents may rest assured, else photographers would not have hesitated so long before adopting this method of printing; and even in the case of successful printers, it must be borne in mind that there is at the present day far more waste than is the case with the production of ordinary silver prints. Such a state of things, however, is only to be expected, since carbon printing is an entire novelty to most photographers, while good silver prints, as we know, have been produced for the past twenty years and more.

We have said that this season of the year is especially unfavourable to carbon printing. In the first place, the dull weather we have lately experienced has necessitated the employment of a stronger bichromate bath than usual, in order to render the tissue as sensitive as possible; and, unfortunately, it is just this further addition of the salt which militates against the keeping qualities of the tissue, just when time is most valuable. The tissue becomes sooner insoluble, and, therefore, more rapidly unserviceable, the greater the amount of bichromate added; although we should mention that even under unfavourable circumstances sensitized tissue ought to keep good several days. One of the first things a carbon printer should do before beginning work for the day is to assure himself of the degree of solubility and sensitiveness of his material, for this varies from day to day; and no better plan can be devised than that of making a preliminary print with a standard negative kept on purpose for such a trial. The printing and development of this preliminary picture will save a good many failures in the course of the day.

Another defect, which the careful printer will easily avoid, is one about which a correspondent complained last week, namely, the tendency of the tissue to adhere to the negative, and bring away with it the film or image from the glass. With fairly dry tissue—for it must never be so far desiccated as to feel crisp to the touch—such an accident as this need never be feared, especially if the precaution is taken to rub the least quantity of French chalk over the negative.

The waxing of the plates also gives some of our correspondents trouble, but in the case of fine work, if they cannot get a satisfactory coating upon the plate by rubbing the mixture over with a cloth, we advise its application in the form of a fluid, the wax solution being poured on in the same way as collodion. The plates must be kept rigorously clean, and when waxed, they should be sheltered most jealously from dust or soot particles, which, once adherent to the surface of the print, cannot be removed with impunity.

The dirty appearance of some pictures is not, however, due so much to particles of foreign matter becoming deposited upon the waxed film, as to the coarseness of the transfer paper employed. In fine work it is necessary to employ quite as good a paper for transferring as the Rive or Saxe which the silver printer employs; and such is not the case, as we have frequently observed. The most delicate carbon picture, if transferred to coarse blotchy paper, must naturally appear defective, and for this reason it often happens that a print which appeared successful upon glass is a failure the moment it has been transferred.

Another point that seems to have vexed several of our readers is the objectionable yellow tint which some of their prints retain from the bichromate salt. This tint should not appear, at any rate to an appreciable extent, in any finished prints, for if the developed image exhibits any signs of yellowness, this is usually removed by energetic washing with cold water, a fine rose being of use under the circumstances. Most of the unchanged bichromate salts will be removed as soon as the exposed tissue is put into cold water to swell, and when the picture is returned into the cold water bath to check the action of development, or further has to be transferred, care should be taken to see that the water in which it is immersed is free from the yellow bichromate. If this is done, it is rare indeed that any objectionable yellowness will be retained. When developing upon canvas, or transferring to that material, there is more risk of this staining, from the fact that if the fibre once gets impregnated with bichromate, it is with difficulty only that it can afterwards be removed.

These are some of the difficulties which seem to beset beginners, but beginners only, in carrying out the process of printing in permanent pigments. Such defects are so easy to get over, that but a slight acquaintance with the carbon tissue will suffice to get rid of them. Photographers who have been accustomed to the production of silver prints all their lives can scarcely expect to become proficient carbon printers all at once, for experience and practised skill alone can render them adepts in the art. In the meantime we are glad to hear that many of our readers have already succeeded to their entire satisfaction in solving that most difficult of problems—the production of small pictures in permanent pigments.

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THE NEW SELENIUM PHOTOMETER.

The lecture at the Royal Institution on Friday evening last, by Dr. William Siemens, was one that could not fail to be of interest to photographers. The subject was "The Action of Light on Selenium," and it is worthy of note that this is the third lecture since the commencement of the session at the end of last month, that has borne upon photography. Thus we had Professor Tyndall, who showed how light was scattered and reflected by the floating particles it contained, and how, by augmenting these, this scattering and reflection of the light could be sensibly increased, leading one to hope that some day photographers may derive some advantage from such a course. Next we had Mr. Crookes, who proved that light possessed a distinct mechanical action which could be utilized actually as a motive power, and who moreover, by the aid of the torsion balance, was enabled to tell us the weight of a beam of light. Last Friday came Dr. Siemens, with his selenium photometer; and to-day (the 25th) the Rev. Father Perry will deliver a lecture on the Transit of Venus. Dr. Siemens, on Friday last, demonstrated the action of light upon heated selenium, the details of which had already been made known to the Berlin Academy of Sciences, and have appeared in these columns on December 17 and 24 of last year. Following up the experiments of Professor Adams and Mr. Willoughby Smith, Dr. Siemens found that a new crystalline form of selenium, an element somewhat analogous to sulphur, was more highly affected by light than the ordinary material. Indeed this crystalline selenium, when exposed to diffuse daylight, at once doubles its conductivity for electricity, and hence an electric current passing at the time records in a definite manner the degree of light shining upon the selenium. M. Siemens exhibited a selenium photometer, and allowed the rays from a standard candle and from a lamp to act upon it, when the marked change that came over the element was at once visible upon a galvanometer. The degree of light is very accurately marked by this photometer, as may be judged by the fact that sunlight shining upon the photometer at once increases its conductivity tenfold; so that the needle of an instrument marking 100 degrees in the dark would at once point to the figure 1000 as soon as ever a powerful ray of sunlight falls upon it. We trust it will not be long before photographers generally will be able to avail themselves of this sensitive and by no means complicated photometer.

FRENCH CORRESPONDENCE.

Vidal's Photometer for Negative Work—Photochromes—Substitute for Ground Glass in Focussing—Vogel's New Book on Photo-Chemistry—Photographic Instruction in Schools—Photography and the German Pea-Sausage.

M. Leon Vidal exhibited to the French Photographic Society, on the occasion of their last monthly meeting on the 4th February, one of his newly constructed photometers for cliché work. This instrument is of the simplest and most portable nature, and is composed of three sheets of cardboard, which are joined together, and which, when doubled up, fit into a case not half a centimetre in thickness. The sheet in the middle carries the photometric scale, formed of ten numbered tints, one to ten, each pierced with a circular opening. A movable cardboard working like a shutter in a camera, and to which a piece of sensitized paper is attached, slides behind this scale and the series of holes.

When you desire to operate with the camera, you take the instrument in your hand, turning your back to the sun, so that your body casts a shadow upon it. You remain in this position for the space of a minute. The light acting through the openings in the centre of the photometric scale colours the sensitive paper more or less according to its intensity. You then observe the number of the tint which approaches most nearly that of the central colour. The degree or intensity of the light thus being known—which we will assume to be No. 5—that table among those which accompany the photometer is selected which corresponds to the focal distance of the lens employed. The finger is moved along the horizontal column of figures which corresponds to the dimensions of the diaphragm, and the column intersecting, which bears the number corresponding to the focal length of the lens, then gives the multiplying figure to be used in order to determine the pose necessary for the production of a negative.

The photometer is constructed for use with dry plates of medium sensitiveness. If you operate with the wet collodion process, then it is necessary to abate the figures given by one-eighth.

It is much easier to employ this photometer of M. Vidal than to describe it, but nevertheless I hope the readers of the Photographic News will be able to gather from my description some idea of the nature of the instrument.

M. Leon Vidal brought with him to the meeting a large collection of his photochromic productions of every class which had been produced under his direction at the printing establishment of the *Moniteur Universel*. Not only were they very much admired, but everybody was truly surprised at the variety of applications to which the process lent itself.

In presenting these pictures to the society, M. Leon Vidal made some allusion to certain articles that had appeared in which his right to the invention was disputed. It was sought to prove that he employed for the production of his photochromes some well known methods. To this M. Vidal replied, as in truth is the case, that he was the first to obtain results of the nature in question, which he had, moreover, produced in an industrial manner.

This is incontestable. Not only has M. Vidal succeeded in producing prints in colour of admirable finish, which have no resemblance with anything that has been done before, but he has called into being a large establishment which turns out such productions upon a vast scale. This is a double merit, and cannot be disputed by those even who pretend to have conceived an analogous idea, and lay claim to such and such a manipulation which forms part of his process.

It is very easy to write down in a patent or a memoir, that one may employ a certain means to bring about a certain result, but it is another matter to practise one's theories, and to produce results in an industrial form.

M. L. Sabunzie exhibited at the same meeting an apparatus for working, without the aid of a dark tent, either the wet or dry collodion process. This instrument, with which the readers of the Photographic News are no doubt acquainted, as it is made and sold in London, has little of novelty about it.

It often happens that in working outside one's studio, the ground glass for focussing is broken, and there is then nothing left but to pack up and be off home again. Many remedies have been suggested for overcoming the evil, but they are none of them of much value, and by no means of such worth as the plan proposed at the meeting to which we refer.

A solution is made by dissolving 35 grammes of gelatine in 300 cubic centimetres of water; it is filtered and warmed slightly, and to it is added 15 grammes of starch. The mixture is boiled for three or four minutes, and then applied to a sheet of glass, which at once assumes the aspect of ground glass.

By taking care to clean the plate first of all with chalk, it is easy to detach the pellicle as soon as it is dry. Several of these films should be prepared for the purpose of an excursion, and when they are required for use, they are simply attached to a glass plate by immersing them in water.

Dr. Vogel has just published in French, through the medium of the firm Germer-Baillière, a work having for its title, "La Photographie et la Chimie de la Lumière." This volume contains ninety-five illustrations in the text, together with a frontispiece by the *Photoglyptic* method, representing a photograph of the moon reduced from the original of Mr. Rutherford, of New York. The work is not what would be termed practical, and contains little of novelty, either in the way of theory or practice; it is rather a collection of papers on photography and photo-chemistry, elaborated by a competent and experienced writer. It was with pleasure that we discovered in it a very important chapter upon photography as a subject for instruction in industrial and art schools.

"It will be necessary," says the author, at the end of this chapter, "that the doors of our fine art schools are opened to adepts in photography, and that their exclusion be no longer insisted on. Experience has already shown that far from being opposed to the true artist, photography seconds his work. The introduction of photography is the more easy, as its study requires but little time, four lessons a week during a term of six months being ample, even in the event of the pupils being ignorant of chemistry. Scientific schools in like manner should turn their attention to the subject, for it is to photography that we owe the reproductions which, when amplified in the lantern, are of such aid to the professor," &c.

Apropos of photography with chromium salts, Dr. Vogel narrates a curious circumstance. It is to the happy application of the property which light imparts to bichromated gelatine, rendering it insoluble, that the German soldiery did not die of hunger during the terrible campaign of 1870-71. The principal food upon which they existed was the well-known pea sausage, and the consumption of this article of diet was so great that it was found impossible to obtain bladders sufficient to contain it. Experiments were consequently made with parchment paper obtained by means of sulphuric acid; but this material was not satisfactory, for the reason that the edges could not be perfectly cemented. A German chemist (Dr. Jacobsen), unfortunately for us, then conceived the ingenious idea of employing bichromated gelatine to coat the sausages, and exposing the same then to the action of daylight, whereby the coating was rendered insoluble. In this state the sausages could be immersed without risk in boiling water, and could receive any amount of cooking that they required. In this way the Germans were enabled to supply their famous pea sausages to the troops in any quantities without difficulty. ERNEST LACAN.

SILVER, CHROMIUM, CARBON.

(A Critico-chemical Comparison).

BY W. HOWARD, ANALYST.

INTRODUCTORY.

"Show his eyes, and grieve his heart;
Come like the shadows, so depart."

OFTEN, when looking at a collection of silver prints, has the above incantation of the weird sisters recurred to my memory, and reminded me of the surely-fleeting nature of those pictures.

About the year 1800, when Wedgwood and Davy made an attempt to utilize an haloid salt of silver as a means of producing a pictorial impression by the aid of light, the witches' incantation was, to their chagrin, literally realized. In a few years, however, by studying the chemical nature of the agents employed, and thus procuring the means of eliminating (as they believed) the unchanged sensitive medium, the philosophers of that age founded the art of photography.

The fond and flattering hope of permanency which was then held forth to the photographer has proved illusive, and, in spite of all that science has done for it, the silver print can only claim to be *a shadow that must fade.*

It can scarcely be a matter for wonder to learn that the deceptive and *evanescent* silver print soon met with a rival production, which based its claim to consideration on the score of *permanency.* The carbon, or, more strictly speaking, the chromium print, was the new aspirant for public and professional favour, and so clearly have its advantages been proved, that it has in the course of a few years revolutionized the art of producing photographic proofs; and it may be said that upon the adoption of *chromium,* or the retention of silver, depends the ultimate fate of every nineteenth century photographer. Introduced to the world a few years after its fore-runner, *silver, chromium* had to struggle against manifold disadvantages. Habit had accustomed the public to silver prints, and practice had rendered the photographer expert in producing them; above all, the new chromium prints suffered from the cabals of certain short-sighted professionals, who magnified the *mechanical* defects which then existed in the process, representing them as radical and unavoidable weaknesses.

By the determined efforts and unremitting study which have been conferred on the process, by those who from the first recognized its intrinsic value, these defects have been removed; and chromotyping bids fair to become *the* printing-process of the immediate future. Such being, as I conceive, the position which chromium must shortly assume, it behoves every member of the profession to carefully consider the reasons which have contributed to this imminent crisis.

The most philosophic course to pursue in making such an enquiry will be to ascertain, if possible, the characteristic phase of feeling which precedes reformations generally. I think that reformation in all cases finds its birth in a general "*desire for change.*"

In order that a reformation shall be lasting and victorious in its results, it is necessary that the "*desire for change*" should be legitimate, *i.e.,* progressive in character.

In the case of chromotyping, a distinct and legitimate advance in the path of progress is made if it establishes its claim to permanency; and this alone, if proved, is a sufficient response to a long-expressed and general desire, and will constitute it a genuine reformation.

It may also be well for the commercial photographer to recollect that the "*desire for change,*" though of a retrograde character, needs only to be wide spread to be irresistible. Imagine, then, the perilous condition of the man who dares to oppose a reformation which, besides being in harmony with a general desire, possesses the inherent strength of a progressive movement.

To properly estimate the value of chromium printing, it is necessary to consider photography in its double nature of *art* and *science.*

We would deem it incredible were we told that an artist whom heaven had pre-eminently favoured with the gift of reproducing nature, or leading us by the aid of his inspired pencil into the domains of fancy, was systematically using pigments which he knew to be of the most *evanescent* nature. We would in truth deem that he made a dishonest use of his talents in thus depriving his patrons of the power of retaining his productions. Such will be the position of those photographers who persist in the use of silver salts as the basis of their work. It is beyond dispute that the fading of silver pictures is merely a question of a few years. Indeed, this disease of fading to which prints produced by silver salts are invariably subject, has, in a greater degree than any other circumstance, been the cause of the low value which true artists attached to its productions.

Moreover the public, which at first hailed the silver print with unbounded satisfaction (because it seemed to offer the means of recording the lineaments of the "loved and lost ones," or of reproducing and retaining the scenes which associations had rendered sacred, or which nature had dignified with grandeur, or endowed with beauty), has at last begun to view it with suspicion, and demands a more permanent production from the art-science. If it has been degrading to the artistic position of photography to acknowledge impermanent results, it has been no less a reproach to its scientific pretensions.

To its scientific co-adjutors (who by reason of their training refuse the doctrines of conservatism) does photography owe the present revelation.

In 1839, the year which was rendered illustrious by the discoveries of Talbot, Mungo Ponton discovered that potassium bichromate might be used to sensitize paper, being decomposed by the action of sunlight. The scientific photographers, who already had reason to be dissatisfied with the evanescence of their productions, soon gave their attention to this new fact, and Talbot soon lent it a fresh importance by showing that it was only in combination with organic matter that this decomposition occurred.

In 1855 M. Poitevin patented a carbon or chromium printing process founded on this principle; this was the first of the since numerous chromotype processes.

To M. Leon Lambert, the last, or rather latest chromium patentee, the process is indebted to an extent which we cannot yet compute. He has cleared away the last of the mechanical defects, and by his able demonstrations exploded the objections which have been raised against the process on the score of tediousness.

Mr. Ponton, serenely spending the days of his old age at Clifton, may proudly recal the fact that he himself sounded the key note of the revolution which is making such rapid and victorious strides.

In the remaining articles of this series I intend to review the chemical characteristics of silver, chromium, and carbon, and their compounds, with special reference to their photographic value and comparative permanency.

Much will of necessity be a repetition of well-known facts, supported by the opinions of standard authorities; but I design to record a few special experiments of my own, which I think will very clearly illustrate the merits and defects of the rival processes of silver printing and chromotyping.

(To be continued.)

THE AID OF PHOTOGRAPHY IN DETECTING FORGERIES.

BY M. GOBERT.*

At one of our former meetings I had the honour to give an account of the use to which photography may be put in helping experts to detect forgeries and false entries in ledgers and upon documents. The principle of this application is not new, and has already been brought to public notice on several occasions. It is based upon the non-actinic property of certain colourless or faintly-coloured substances, which, while invisible to the eye, is recorded in the clearest manner by means of photography.

It is well known that a photographic print which has become to some extent faded by time, is easily reproduced by photography with all its details and former intensity. In general, all yellow colouring matters, even when very faint, permit of this experiment being made. Peroxide of iron, for instance, when present in the smallest proportions, so as to be quite imperceptible to the eye, will furnish photographic impressions of considerable vigour.

Acquaintance with these facts has led me to employ the camera to detect certain forgeries traced with Indian ink. You know that ordinary writing ink is a compound of tannin and oxide of iron. You are aware also that there exist many plans for effacing marks made by such ink; but most of these leave, either on the surface or in the body of the paper, some traces of peroxide of iron. Chemistry easily reveals these traces to us, but the photographic lens detects them with the same facility, and has, moreover, the advantage of not tampering in any way with the paper in which the marks are contained; moreover, by enlarging the object to be photographed, we obtain, on magnifying, very surprising results.

I have the honour to place before you this evening two enlarged impressions of a forgery committed upon a cheque issued by one of the principal Paris houses. This cheque, in the first place, was one of 105 francs. The forger, making use of an erasing substance, effaced the words and figures, and converted the cheque into one for 5,000 francs, the negociation of which he forthwith attempted. The forgery, as all the members will observe, has been most cleverly executed, so that to the eye there is nothing to lead one to suppose there is anything wrong. Nevertheless the photographic apparatus, as soon as it was called into requisition, proved the affair a forgery, for upon the photographic film was found depicted the original sum, and you can see it upon the prints I have brought before you, the original figures and words confounding themselves with those more recently written.

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[*] Read before the French Photographic Society.

Correspondence.

COST OF CARBON PRINTING.

Dear Mr. Editor,—To curtail expenditure of time and space, I abjure prefatory remarks, and at once proceed to reply to my several censors.

A *nom de plume* is legitimate when unassociated with "puff" matter. A communication that reads like an advertisement should be endorsed with real name, to prove *bona fide* disinterestedness on the part of the writer. The "Old Photographer" (whose re-appearance I hail with delight) hit two nails hard on their heads when, in substance, he asks, in his own genial way, "What of photographers whose printing staff consists of daughters and wives? What if the carbon process (which is sometimes innocent of the presence of carbon) should give proofs of its permanent character by unmistakable examples of decay? These questions need no answer from my pen, as others have, or doubtless will, tender replies.

"A Carbonist" accuses me of fostering an intention of damaging the cause of carbon printing. In reply to this charge, I confess myself human. More than human must I have proved had I suffered in silence whilst a huge monopoly was moving heaven and earth to turn myself and little ones out of doors. I sought not the contest; it was thrust upon me by what seemed to me the unfair means employed in pushing the carbon process into notice with a view of inducing general adoption. It is a custom that would be more honoured in its breach than in observance to apply the quip sarcastic to poor and struggling photographers. Thank heaven! I am incapable of extending sympathy to splenetic attacks on men of dwarfed capacity or means. "Live, and let live," is an excellent motto. Every man has an undoubted right, in the struggles of life, to seize on any vacant corner that presents itself in the fields of industry. Moreover, it does not necessarily follow that poverty is at all times a stranger to skill. I am acquainted with two gentlemen, professional photographers, whose art instincts amount to absolute genius. Yet because their refined tastes compel them to reproduce faces and forms as they are, and not as their possessors would have them, scant patronage is bestowed on the artists, and both men are poor. A highly successful photographer once remarked to me that he had realized a fortune by humbugging the public. Two cartes were in juxtaposition (placed in an album). "Mother and daughter?" I remarked, interrogatively. "Same person," was the rejoinder; "old one just as the old lady is. The other was liked best, and brought a good order." Remember, it is this kind of discrimination that is appealed to when the public is asked to concede its preference for carbon. The public is an uncertain factor to import into any social problem; like an overgrown baby, it is all eyes, and until those are gratified it is useless to appeal to its ears. Hence it may be fairly conceded that Mr. Hall has taken just grounds in contending that the public will turn a deaf ear to the promises of less beautiful carbon, as long as its eyes are pleased with present perfection in the shape of a dozen cartes printed in silver and sold for eight or ten shillings.

Mr. H. Gregson, in recording his experience, has imbued his remarks with so much of transparent candour, that every one who has read them must have concluded them to b impartial and true. Not only has the writer just named shown that the public has a preference for photographs printed in silver, but he proves the "Old Photographer" to be "second sighted," "a medium," or prophet, inasmuch as carbon prints now in his (Mr. H. G.'s) possession have seared like autumn leaves, have unmistakably faded. A correspondent, in a private letter, informs me that, in addition to fading, they "peel."

James Owen complains of the weakness of my arguments; but the marvellous strength of his mental grasp is forcibly evidenced in the statement "that my arguments are all on one side"! His diatribe against poor photographers I have already replied to; it therefore only remains for me to comment on his faith in hard work. I assume he is a very young man, he is so enthusiastic when wrtiing of labour. Does he read the daily papers? If he does so, is he acquainted with the depression that exists in most trades? When he has extended his experience of life he will learn that the first to suffer from badness of trade are those whose daily bread depends on the sale of dispensable luxuries (an exception to this rule is to be made in the matter of beer and tobacco).

I have replied to the most salient points achieved by my friends and adversaries, although, in the main, the question to be decided has been by both set aside in favour of collateral issues. I would respectfully suggest that until the question of cost of producing carbon prints as compared with printing in silver is exhausted, this subject may be strictly adhered to. By-and-bye side issues might be dealt with, when I shall be quite prepared to dispute the claims set forth by "carbonists," either on grounds of perfection or permanency.—Yours truly, W. T. Bovey.

FADING OF CARBON PRINTS.

Dear Sir,—As there is some controversy going on about the permanency of carbon prints, I should like to relate the result of an experiment I made some years since with a carbon print received from Mr. Swan's establishment, at Newcastle-on-Tyne. I cut the print in two, and placed one half in a desk, and the other in the light of a glass room, mounted in a frame to keep it from dust. In a few weeks the whites of the latter had become of a dirty yellow, and the rich warm tone of the print had changed to a greenish black. I supposed that some pigment such as a crimson lake had been added to the black, and as the lake faded in the light (as all lakes do) it left the print of the disagreeable colour mentioned. The yellowness of the whites was, no doubt, produced by what remained of the bichromate of potash being still further acted upon by the light. People will say that I am an interested party, but I feel sure that many others, who have had occasion to hang specimen carbon prints in a strong light, have met with similar results.—Yours truly, C. Durand.

Sir,—There is so much at stake in the possibility of a carbon print fading that it demands a searching inquiry. I therefore propose that the profession resolve itself into a committee of the whole house, examine their specimens, and report.—Yours truly, W. Hall.

A FEW WORDS ABOUT CARBON PRINTING AND ITS RELATIVE COST.

Sir,—Allow me to express my thanks to "A Carbonist" for his frank, outspoken opinion on the subject of the cost of carbon printing. The writer says a few very sharp, but, at the same time, very appropriate things, worthy of due consideration. It is too early in the day to make calculations on the relative cost of silver and carbon printing, because the results to be arrived at cannot at present be made accurately, based, as they must necessarily be, on a very slender experience. It may prove of interest to inquire into what is done by others who have worked the carbon process for a longer period. In Paris I know of one firm still using both methods, but for all carbon prints double the price of silver ones is charged, and readily obtained from that majority of persons who infinitely prefer paying double price for what they know to be permanent. Under such circumstances it will readily be admitted that it is a waste of time to make odious comparisons. It may fairly be asked why the price of photographic productions is declining almost daily? Is it because those who produce them are aware of their little value that they make them so cheap? There cannot be the least doubt about the baneful influence of cheapness in the production of works requiring some culture and refinement. On this particular subject "A Carbonist's" words are quite to the point.

It may be a source of joy to some minds that the carbon process of printing should be "costly," but I am not prepared to say that it is beyond the reach of most photographers, either from its expensiveness, or the difficulties attending the working of it.

I will only add a few words which I believe to be in season. A private letter just received from Vienna contains the following:—"I cannot send you my portrait; the photographer declares he cannot print it. . . . . For the last two months we have had from two to three feet of snow on the ground." If we have not had cause to be pleased with the weather we have had lately, it may be a consolation to know that there are worse places in the world. However, with the thermometer at eight degrees below freezing point, I have been able to obtain two rounds of carbon printing daily, in a studio where all the glass is frosted, and silver printing quite out of the question.

The conclusions are obvious. It cannot be said with truth, if carbon prints are held in higher estimation, and paid for at a much higher rate, that the working of the process is more expensive than silver printing. My second assertion is, that carbon printing is three times more rapid than silver. This is a very fit opportunity of testing the truth of my statement, which, I venture to say, will be found quite correct on careful investigation. I say three times quicker; but were I to take my printer's opinion on the subject, I should have to say four times; but then he is an enthusiast, and due allowance should be made for his feelings in the matter. I may add, quite *entre nous*, that he is already deep in love with the stranger, although he knows that the disestablishment of his old practice is at hand.

Finally, if it can prove of comfort to some, I may add that there need be no haste or anxiety about the matter. The change will be a gradual one, as it has been very properly suggested by the Editor of this paper; but it must not be forgotten that the change must come through sheer force of circumstances, and the best advice which can be given to all concerned is to prepare for it. In offering some information on a few of the questions upon which carbon printers are accused of remaining silent, I wish it to be understood that my statements are absolutely within the limits of demonstration by actual practice, and are made with the sole object of being of service to all who enquire with an honest purpose.

A Practical Carbonaro.

EXPLOSIVE GAS-BAGS.

Dear Sir,—An article upon explosive gas-bags in your eminently useful Year-Book reminds me of numerous mishaps with hydrogen some years ago when studying chemistry. The characteristics of hydrogen in my hands appeared to be metamorphosed. The jars, although, of course, filled in water, *would* explode with the utmost unanimity; and many a narrow escape for my eyes I had until it occurred to me to cover the mouth of the jar or orifice of the cork with wire gauze; placing, in fact, a Davy's safety lamp between myself and the bulk of the gas. The plan answered *a merveille*. I had no more explosions, to the joy and comfort of everybody else in the house.

If the hydrogen retained its purity upon ignition outside the gauze, the flame burnt steadily. If atmospheric air had intruded, the flame would either be very unsteady, or fail to remain at all, going out with a little pop.

I think if Mr. Swan tries this plan by placing a diaphragm of gauze in the tube near the burner, he will never demolish any more drawing-rooms with either carelessly filled bags or imprudently treated half filled ones, which are often allowed to imbibe air, forming thereby a very respectable household torpedo.—Yours faithfully,

Exeter, February, 11. J. Rolls.

SYPHON, OR NO SYPHON.

Sir,—Reading in your two last weeks' journals so much respecting emptying of baths, I cannot see why I should refrain from saying a word or two respecting the same. I merely take a large mouth bottle in my left hand with a good size glass funnel in it; I then take my dish and tilt it from the furthermost corner so as get the solution (describe it as simply as I can) three cornered in the dish; the one corner, of course, would be the spout, which I let reach nearly to the furthest end of the funnel, so as a portion of the bottom of the dish is over the funnel; I then pour the solution as simply and as easily as possibly can be, the whole process not taking longer to do than to read how it is done. I must say I use a tolerably large size dish, as I float half sheets of paper.—Yours respectfully, E. L.

MASKING, ETC.

Sir,—As the following may be of some use to many young printers, I hope you will find a small space in your estimable journal for its insertion.

Some years ago I visited a photographic exhibition in Germany. I was amazed at the many beautiful pictures. After looking attentively one by one, I came across the portrait of a young lady, whole sheet, three-quarter face vignette. I saw in this portrait something more than I could account for. I was a long time in front of this portrait—my eyes looking at the picture, but my mind with the printer. I walked along, but I could see nothing else, for I always had the portrait of the young lady before me; in fact, I went back again, and, viewing it from every position, it had a magnificent effect. It appeared to me as if it was detached—almost a relief. In getting nearer, I noticed that the whites were pure, and the margin was a faint rose colour.

I will now briefly explain how I have done it since that day. When I take my print out of the frame, or down from the solar camera, I take a pane of plate glass of the same size, and, drawing my yellow blind in the dark room a little on one side, I place the pane of glass perpendicular on a stool in front of the window; then I put on it the vignetted print, holding the two together with my thumb in the front, and the four fingers at the back, of course at the top of the print and glass. I put over this a transparent paper (generally a thin white sheet of blotting-paper), and so, holding with my left hand the glass, print, and blotting-paper, with a pencil in my right hand I mark on the blotting-paper all the contour; that is to say, I begin from the top of the hair, hat, bonnet, or whatever it may be, coming down to the right, around the face, neck, collar, and shoulder; then, beginning again from the top, I trace the left side; by doing so I cannot move the blotting-paper. Of course, I always take in what belongs to the head and body. Now it remains to mark the lower part of the body, which is the most difficult part. I generally mark, for a whole-sheet portrait, an inch above the last graduated mark of the vignette, then put aside the print, and place the blotting-paper over a cardboard horizontally on the stool (I generally use the cards I receive with the albumenized paper); then, placing my left hand in the middle of the blotting-paper, with the right hand I cut with the scissors all round the pencil-mark, of course cutting card and blotting-paper at the same time. When this is done, I put aside the blotting-paper for the use of cleaning dishes, &c., and I cut from one shoulder to the other so many rags or teeth about half an inch deep, which I curl up with my fingers; now I take my silver print, place it horizontally over the glass, cover the head and body with the mask I have made, having the lower part the shape of a vignette, place a small weight in the middle, and expose it in the glass house, taking care, as usually the light in the portraits is coming from the back of the head, I place the face nearer the glass-house (I mean opposite to where the light comes in the portrait). I expose it about one minute, then take another cardboard, and hold it up horizontally at a distance of seven or eight inches, cover up half of the sheet where the light comes (not in the glass-house, but in the portrait), and moving to and fro for about another minute, or till I think sufficient for my purpose, then cover up the whole picture.

All these operations do not take more than six or seven minutes. I give it a very warm tone, and by so doing the artist has no reason to complain of not having any white, and the effect is, I think, magnificent. If it is wished to give a darker tint, it would be better to expose in the plain light, moving the pane of glass round and round, by doing which the mask will not mark sharply.—Yours, respectfully,

Gustavo.

Proceedings of Societies.

West Riding of Yorkshire Photographic Society.

The ordinary monthly meeting of the above Society was held at the Victoria Hotel, Bradford, on Monday, the 10th January, at 7·30 p.m, Mr. Smith, the vice-president, in the chair.

After the minutes of the preceding meeting has been confirmed, the Society proceeded to the election of a president in the room of Mr. J. W. Gough (resigned), which resulted in the promotion of Mr. John Smith, the vice-president, to the presidential chair.

Messrs. Wolstenholme and Jennings were elected members of the Society.

The Secretary read a communication, and laid on the table a diagram, from Mr. D. Winstanley, F.R.A.S. (see page 87).

Mr. Batho remarked that as light travelled through a medium of varying densities, its power would vary according to the density of the atmosphere at the time of observation. He had himself, some two years ago, constructed a piece of apparatus for making actinic observation, and the light danced about like the mercury in a barometer; and he thought it would possibly be demonstrated that the light varied with the rise and fall of barometric pressure.

A vote of thanks was accorded to Mr. Winstanley for his interesting communication.

Mr. Howarth handed round a copy of "Tissandier's History of Photography" for the members' inspection, the frontispiece to which (a photo-tint by Messrs. Edwards) being much admired.

Mr. Batho exhibited a small contrivance for securing mechanical registration in carbon printing, and promised to show at an early meeting a new actinometer.

After some further conversation the meeting adjourned.

Another ordinary meeting was held at the same place on the evening of the 7th inst., the President occupying the chair.

The previous minutes having been confirmed, Mr. Cook Keighley was elected vice-president of the Society, and Mr. Crabtree was elected a member.

Mr. Batho exhibited some experimental slips of carbon tissue and silver paper which had been exposed to light in his new actinometer, the gradations of which were singularly fine, and were much admired; and promised to exhibit the instrument at the next meeting.

Mr. Sachs said he would exhibit at the March meeting some specimens of M. Leon Vidal's photochromes, and Mr. Batho undertook to describe the process by which they were produced.

The meeting then became of a social and conversational character until its adjournment.

Talk in the Studio.

South Kensington Museum.—It will interest our readers to learn that Mr. Frederick York, of Notting Hill, has just entered into arrangements with the Council of Education, to produce a series of the most interesting subjects at the South Kensington Museum, and to publish them in monthly parts at a shilling each. The value of these photographs in an artistic and educational sense cannot be over-estimated, and the advantages to the public in having such access to the treasures of the Museum will we trust, be fully appreciated.

"Smile and Look Pleasant."—It must be confessed that photographers make a mistake when they tell you to "smile and look pleasant, ma'am;" and often make a failure too. It is not always easy to smile and look pleasant, without looking silly also. But no one would like to be "taken" at unawares, unless in some moment of happiness, or when one is at least free from such utter misery as Dorothy suffers from. If we lose our way, as we so often do, let us remember that the world's great lens is opposite our faces.—*Hand and Heart.*

Action of Light on Chemicals.—A correspondent of the *English Mechanic*, signing "Tuebor," gives the following:—'Among the chemicals altered in colour by exposure to light are the following:—First on the list will stand the silver salts, of so much use in photography. Some are exquisitely sensitive, some less so. Next, the yellow solution of potassium bichromate is turned to a reddish brown; subiodide of mercury from a yellowish brown becomes of an olive green; brilliant crystals of santonin in direct sunlight pass from white to a vivid lemon yellow; ethyl iodide, at first colourless, changes to red; guaiacum powder from grey to blue; potassium ferridcyanide loses its crimson tint, and assumes a blue; ammonio-citrate of iron, chloride of gold, and a certain bitumen are so changed by the action of light as to be of service to the photographer; alloxan, uramile, and thionuric acid, derivatives of uric acid, are altered from white to pink, pink to crimson, and crimson to purple, by exposure—though it is only fair to say that the air plays the best part in these changes, as it also does in turning salicylol to a fine red. Some of the above tints can be fixed by suitable chemicals, some of them not—the silver salts being amongst the former—while none will yield all the shades by treatment with different colours by means of glass."

To Correspondents.

Boxwood.—One of the best plans for producing photographs on wood is by means of a fatty ink process, and there have been several methods of this kind detailed in the News lately. "Lichtdruck printing without a press," in February 5th of last year, would answer the purpose. It is not an easy matter to produce a good picture on wood, and only those who make the matter a special study succeed well. You may secure a photographic print by the silver process, but you must first rub the wood with a fine white pigment, applied by means of a little linseed oil, removing subsequently all except a trace which is barely sufficient to whiten the ground; sensitize in an eighty-grain bath containing a large proportion of alcohol, to overcome the greasiness; then proceed in the ordinary manner. There must be no perceptible film formed upon the wooden block, otherwise the cutter cannot proceed with his work.

A. F.—The alum bath may be used over and over again.

Duffer.—See leader this week, and Answers to Correspondents of last week.

Amateur.—Nelson's gelatine is suitable.

Pyro.—Photographs on linen are not injured by washing; indeed, they are rather improved than otherwise.

J. H. S.—The silver would, no doubt, be partly in the form of bromide, and partly in a finely divided metallic state. The best way to utilise the same would be to fuse it in a crucible, or add it to chlorides and other waste for disposal to a refiner.

Experimenter.—Paraffin oil will not answer the puspose you mention; solid paraffin must be melted and employed.

H. Bearcroft.—The varnish would not injure the photographs, but, on the contrary, would preserve them from deleterious vapours; but you must not employ a dark varnish that will stain the prints. Newman's (24, Soho Square) print varnish would do.

T. T.—Salts of gold or chloride of gold is employed for toning albumenized prints.

Carbon Printer.—You can purchase the tissue ready sensitized if you wish, and in this weather it will keep good many days. But, if you use it in small quantities only, it is best to sensitize it yourself.

J. M. W.—We do not see how you advance the subject at all in your letter, and our columns are much crowded with matter just now.

—— (Hastings).—1. If you find your plate too large to hold by hand or with the aid of a pneumatic holder, you must have recourse to a levelling stand or developing dish; it is of little consequence, however, if the developer does run off the plate a little. 2. See an article on carbon transparencies, by Mr. Willis, in our Year-Book. 3. We cannot refer you to the subject just now. 4. We think not, but you had better apply to the Autotype Company.

A. B. C.—See our leader this week.

George.—Many processes for printing in greasy ink have appeared in our columns. Only two or three months ago there was one by M. Laurent.

Permanent Photo.—1. Chrome alum. 2. See leader this week.

James Tennant.—There are one or two papers on the negative bath in the Year-Book just published, which will give you the information you require. To strengthen weak baths, employ a strong solution of silver of known quantity (with three or four times as much nitrate as in your bath), and add this to the bath until the latter has attained the strength you want. It is not due merely to the developer that nice white pictures are produced; the formula for a developer given with Mawson's collodion answers very well; but a reference to our columns will make you acquainted with a number of different formulæ.

J. S.—Have you added *too much* acid to your bath? Is it worn out, containing too much iodide, and, perhaps, other? If ordinary means will not bring it round, nor rest, we should employ it for sensitizing, and make up a fresh one. The yellow spots in the print you send us are due to hypo, the other to the paper being too dry and horny when sensitized; put the paper in a damp place prior to floating. (See Photographic News, 29th January, 1875.)

Argent.—If the negative presents the appearance you describe, we fancy the bath does not contain enough silver. If, however, this is the case, add a few drops of acid, and permit a plate to remain in it for some time to get the solution iodized again.

Carbon.—The Autotype Company. You must pay for instruction.

A Correspondent.—Your note has been mislaid; please repeat queries.

A Hardworking Printer writes expressing his sense of the value of the suggestion made under the heading of "Blisters," in our issue of the 11th. He says:—"I have every day from thirty to fifty sheets of paper to print, and four or five batches of prints to tone, and I have not time to make for every batch of prints a fresh solution of hyposulphite, especially with this cold weather, when the hypo does not dissolve freely. I must return my sincere thanks to the writer, for now I can turn my prints up and down without freezing my hands, and, to my great surprise, all the trouble about blisters has vanished."

A.—The removal of the yellowness from the bichromate does not usually give the carbon printer much trouble. See our leader.

Nil Desperandum.—You want us to tell you everything about photography, apparently. The landscape you send would be fair if the lights were not degraded. We suspect you allow the developer to rest upon the plate too long. It should give rise to no blue tint when applied. Try the landscape again, with the light shining upon it, and not into your camera; do not over-expose, neither over-develop your plate. For fixing, employ as strong a solution of hypo as possible. Print upon freshly sensitized paper, and tone and fix at once, washing thoroughly afterwards. See that your dark room is light-proof. We have no doubt your chemicals and formulæ are suitable.

W. W.—We should think slate would answer the purpose, cemented with white lead; but a glazed earthenware or glazed metal trough might be better. 2. Two-thirds of a grain per ounce is evidently meant, although personally we have no experience in the matter. 3. There would be no harm in dissolving the glacial acetic acid as you propose, only the strength of the solution must be borne in mind. 4. Nitric acid would act upon the lead; better employ a vessel of glazed earthenware, if procurable.

C. B. F.—Either your bath has had scum floating upon it when you dipped the plate, or you have poured the dregs of the developer over the film.

T. J. Dixon.—Any plain collodion will do, but we prefer it rather thick. Try ether 5 ounces, alcohol 5 ounces, pyroxyline 60 grains.

H. N. King writes, in answer to a correspondent respecting india-rubber lined baths, that they are made by Mr. Elliott, Jewin Street, and that a pure india-rubber may be obtained of the India-rubber Company, Cannon Street, to any size required. "A former correspondent," he adds, "wrote to you asking where ebonite baths could be repaired. I have used a 15 by 12 one for over five years, which on more than one occasion has got damaged travelling, and I have taken it to the Company mentioned above, and they have repaired it."

Q. (Studio).—Next week.

Several letters and articles in type are compelled to stand over.

Several Correspondents in our next.

The Photographic News, March 3, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Permanency of Carbon Prints—The Transit of Venus—Photographing Machinery.

The Permanency of Carbon Prints.—We have heard a good deal lately about the deterioration—one can hardly say fading—of carbon prints. Are the pigment pictures, which are growing every day more general, really permanent; or can no more reliance be placed upon their durability than other photographs? If carbon prints are properly prepared, say some, then there can be nothing more permanent, but then the same almost might be said of silver prints; if these are well printed, and effectively washed, then these, too, are durable enough. Again, the argument that light acts upon the carbon print may be fenced by the statement that, if this is true, it is true also of almost everything else under the sun. A deal door is photographic enough to have any impression printed upon it, if you only allow it to remain in the sunshine long enough, and human flesh and blood are, as we know, exceedingly sensitive to the action of light. It appears to us that the deterioration of pigment prints, when it takes place, must be due to two main causes; either the soluble bichromate has not been entirely removed or fixed, or the pigment employed in the production of the print is of an unstable character. If we have an unstable colour present, our pigment prints may fade in the same way as coloured book covers, most of which are of a vegetable or aniline nature, bleach after remaining exposed to the sun for some time. But then engravings, printed from wood or metal, fade also to some extent it must be remembered, and there are very few old pictures which do not betray signs of weakness and yellowness. No doubt, we should have many of our books going in the same way, if the leaves were always kept open facing the light, and for this reason we hold it scarcely fair that pigment prints should be expected to encounter, for any length of time, the glare of full sunlight, the action of which has an effect upon most objects. But it behoves us to attend attentively to the two points we have mentioned, if we wish to rely upon our pigment prints, in any sort of way, for so long as sensitive chromic salts remain in the picture, or the tissue contains any appreciable amount of unstable pigments, so long shall we be unable to depend upon the unalterability of our pigment prints. So far as our own experience goes, we have never seen a pigment print that has faded, although we are nevertheless quite ready to believe, as correspondents in these columns have pointed out, that pigment prints have been known to change in some degree, and we certainly must have a care that we do not rely upon carbon tissue, which contains no carbon at all. There is little chance of this, however, and, from the circumstance that the tissue is well washed during development and prior to its fixing in alum, it is difficult to see how any of the soluble salt can remain in the tissue, which is generally freed from the same on its first immersion in cold water. We have had experience of the carbon pictures produced by means of Braun's tissue, Marion's tissue, Swan's tissue, and that of the Autotype Company, but in no instance have we observed signs of fading in them, or, indeed, of any deterioration. We may, however, here mention an instance of alleged fading, as it attracted some attention at the time, as being a case of a very marked nature. A gentleman in Paris much interested in the carbon process, informed us about a year ago that he had in his possession an unmistakable proof of the fading of carbon pictures, but before making the circumstance, which seemed to him so impossible, generally known, he communicated the matter to us, and also to Mr. Baden Pritchard, of the Woolwich Arsenal, from whom he had received the prints nearly two years previously. He had in his possession several pictures, all military subjects, which Mr. Pritchard had forwarded to him, and one of them, representing a battery of horse artillery fully accoutred and equipped to take the field, had faded to such an extent that only faint outlines of the picture remained visible. The affair seemed inexplicable, and after a while Mr. Pritchard received from Paris a portion of the picture in question for examination. The whole matter was then apparent, for upon the back of the piece returned was still a pencil mark of "⅛," signifying that this was a picture which had been printed but one-eighth its proper time under the negative, and then developed. A discussion had taken place, it seems, at the French Photographic Society upon the question of "Printing in the Dark," and several Parisian photographers who had essayed to print their carbon pictures by allowing the same to remain under a negative in the sun for some time, and then permitting the printing action thus set up to continue in the dark, had failed altogether to secure trustworthy results, and it was to prove that the thing was perfectly feasible that Mr. Pritchard forwarded a selection of pictures to Paris. Among them were two prints, both of which had been printed but one eighth their proper time under a negative, one of them, being developed at once, naturally yielding a very weak image, and the other after a lapse of forty hours, which had had time to become a vigorous impression enough. The so-called faded image was therefore no other than the very light carbon print, the history of which our friend in Paris had meanwhile forgotten.

The Transit of Venus.—Upwards of a year has now elapsed since observations were made in all parts of the world of the transit of Venus across the sun's disc, and yet we have not as yet heard a syllable about the conclusions which the photographic and optical results are to furnish. The mathematical calculations to be made from these data are, as may be readily understood, very intricate and elaborate, and we have heard that the Egyptian pictures, at any rate, which were taken by Captain Abney, R.E., and Captain Browne, R.A., have given much satisfaction at the Greenwich Observatory, where the calculations, so far as this country is concerned, are being proceeded with. France, Germany, Italy, Russia, America, and Great Britain are all engaged in calculating, from the transit of Venus observations, the distance that we are from the sun, a problem which has before been attempted from observations made during the same phenomenon. In the present case it is anticipated that the photographic records will correct several errors which have been made in past calculations, and astronomers will not be surprised if we have been hitherto out of our reckoning by some millions of miles. As all the countries mentioned are making independent calculations, based to some extent upon independent observations, we shall, no doubt, get very near the truth this time. It will be a matter of some little interest to see which country will be the first to make known the result of its calculations, but we may say that it is confidently expected that Russia will be the first to complete the arduous task.

Photographing Machinery.—The use which manufacturers make of photography is shown by the circumstance that some of our larger firms retain the services of a photographer, whilst others have so much work to do that a studio and photographer form a portion of their establishment. For some time past Krupp, the well-known cannon manufacturer at Essen, has availed himself of photography to a large extent, and has indeed gone so far as to adopt the Lichtdruck process, for the number of copies frequently required of one plate or another is so large that their production would necessitate a long time if printed in silver. In securing records of models, or of finished work, before it is sent out of the workshops, photography is found to be extremely useful, and such firms as Penn and Sons, of Greenwich, Sir Joseph Whitworth and Co., and Sir W. Armstrong and Co., of the Elswick Ordnance Works, employ the art frequently in this connection. Photographing machinery is by no means an easy matter to the beginner, for it is difficult at one and the same time to show intricate mechanism on the under side of a machine, while the high lights are not solarised. The hand mirror is sometimes very skilfully made use of in work of this kind.

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INVESTIGATIONS RELATIVE TO THE EMULSION COLLODION.

BY LEON WARNERKE.*

On the Influence of Certain Bromides on the Collodion Emulsion.—Next to pyroxyline in the magnitude of its influence on the collodion emulsion is the choice of the halogen salts used in its preparation. Numerous experiments and long practice established the superiority of cadmium and ammonium salts for collodion-bath processes; and routine being introduced, the very same cadmium and ammonium salts, nearly without exception, are used also in the emulsion under entirely changed conditions, which, however, permit the use of such haloid salts as were banished from ordinary collodion for their instability or deleterious action on the collodion, or insolubility in the mixture of ether and alcohol. The emulsion process, however, imperiously demanded an examination of the principles reputed sound for ordinary collodion.

We have already witnessed the introduction of many new principles diametrically opposite to the old—such as, for instance, the introduction of nitro-glucose, or some similar organic compound, which Dr. Van Monckhoven, at the sacrifice of ether and alcohol, washed out from the ordinary collodion, the exposure of plain collodion to light before sensitizing, reversal of the relative proportions of bromides and iodides, and many others.

I took for the basis of my present researches simply bromised washed emulsion with eight grains of high-temperature pyroxyline, and seventeen grains per ounce of silver nitrate. Of that seventeen grains of silver I decided to convert—

14 grains by various bromides,
1 grain by aqua regia,
2 grains being left for the organic reactions of the pyroxyline and for excess.

The following eight bromides were chosen for the first experiments:—

Bromide of potassium,
,, sodium,
,, ammonium,
,, cadmium,
,, iron,
,, zinc,
,, uranium;
Solution of bromine in alcohol (possibly containing bromal).

I scarcely shall surprise anybody when I say that most carefully calculated combining proportions of silver and different halogens, based the theoretical equivalents, will give most inaccurate results. In view of my present investigation, I got nitrate of silver and eight of the bromides named, and determined their combining proportions.

The following table is the result of that preliminary work:—

	Potas. Bromide.	Iodium Bromide.	Ammon. Bromide.	Cad.* Bromide.	Iron Bromide.	Zinc Bromide.	Uranium Bromide.	Bromine.†	Aqua regia.‡
	grain.	grain.	grain.	grain.	grain.	grain.	grain.	min.	min.
Quantities necessary for conversion of 1 gr. of silver nitrate	0·741	0·599	0·555	0·995	0·800	0·699	1·149	2·114	1·15
Silver nitrate necessary for conversion of 1 gr. of bromide	1·35	1·67	1·80	1·005	125	1·43	0·87	....	0·87§
	(1·429)	(1·65)	(1·73)	(0·885)		(1·59)	(1·21)		

* Cadmium bromide ordinary (not anhydrous).
† Bromine, one fluid drachm dissolved in one fluid ounce of alcohol.
‡ Aqua regia was made from hydrochloric acid (sp. gr. 1·18) two parts, nitric acid (sp gr. 1·420) one part.
§ 0·87 grain of silver converts one minim of aqua regia.
Numbers in parenthesis ( ) are theoretical combining proportions.

In the first instance silver nitrate in water and alcohol was introduced into the collodion, and next day followed different bromides and aqua regia. A marked difference was at once noticed in the appearance of every bottle of emulsion. Potassium was the most opaque, uranium very thin, but bromine the thinnest of all. On the addition of cadmium a precipitate was formed, but very soon dissolved again. Potassium, after half an hour, showed a granular appearance on the glass of the bottle, formed, I presume, by nitrate of potash; sodium less so. The behaviour of iron was quite exceptional; before aqua regia was added, the emulsion, white in the first instance, blackened suddenly. I expected that nitrate of iron would reduce the bromide of silver; but I supposed that this would occur only in the presence of actinic light: experiment proved otherwise. To remedy the evil I added aqua regia till the emulsion whitened again; but this quantity (forty minims per five ounces) made excess of haloids instead of silver.

In this stage the emulsion was tried in the camera in the wet state; and iron, cadmium, ammonium, and sodium, were most sensitive in the order named.

When exposed to direct sunlight, ammonium assumed the most intense blue tint; potassium approached the nearest in tint and intensity; sodium, cadmium, zinc, and bromine were more red; iron brown; uranium did not blacken, but some part became intensely black without being exposed to light.

After twenty-four hours' standing the emulsions were spread on glass, and, when set, washed, dried, and re-emulsified in equal proportions of alcohol and ether.

Each formed now an excellent creamy emulsion, ruby by transmitted light—iron and potassium the most opaque, bromine and uranium the thinnest.

The following is the classification according to different qualities, and order:—

Sensitiveness—Zn, Cd, Na, Fe, NH_3, K, Br, U.
Intensity—Br, Zn, U, NH_3, Cd, Na, K, Fe.
Fogginess—Cd, Fe, Na, NH_3.
Blue under the action of daylight—U, NH_3, K, Na.
Red under the action of daylight—Zn, Cd.
Gqey under the action of daylight—Fe, Br.
Sensitiveness to yellow light—Zn, K, NH_3, Br.
Zensitiveness to heat—Fe, Zn, U, NH_3, Na, K, Br.

The zinc emulsion for negatives left all others far behind in every respect. Potassium, though less sensitive, possessed other qualities recommending it.

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* Continued from page 87.

The superiority of both these salts that I mostly appreciate is, that they bear very long (almost unlimited) action of a strong alkaline developer, without the slightest tendency to fog, and thus permit the bringing out of details in the shadows.

Of all the series, cadmium is the most apt to fog and to be ruined by incautious development. The first two, by prolonged development, acquire details and density, while others after a certain state begin to recede; and if a slight mistake is made in exposure, no forcing can remedy it, but rather hastens the ruin. This retrograde action, noticed by Carey Lea in his late letter, I often observed; but I think it happens more often when cadmium salts are used. Bromine emulsion, though less sensitive, possesses nevertheless a very valuable quality, perfect clearness of the shadows and great intensity, making it especially suitable for copying engravings. The iron and uranium experiments are not conclusive. To the first some restraining agent must be added, to prevent the reduction of silver; in the second, aqua regia is superfluous. It is apparently so restrained by the action of uranium nitrate that, even when bromide of potassium was not mixed with the developer, no fog was produced. The visible action of the light passed through the yellow glass is also very remarkable. Cadmium is the least affected; zinc, potassium, ammonium, are the most so. If the developed action is also different for various coloured lights (I intend to examine this subject on a future occasion), we shall have a new principle to introduce in our investigations of actino-chemistry.

The enormous difference observed in the negative produced by the emulsions (in all respects identical save one) forcibly point to a principle that has been overlooked in our reasoning on the photographic reactions, viz.:—The metallic bases of the haloid salts introduced into the collodion react on the pyroxyline of collodion, form organic salts, resisting the action of washing by water, to which the half-dried collodion is subjected, and have a powerful action on the photographic property of collodion, affecting especially sensitiveness and intensity.

That pyroxyline is not inert to the action of different compounds; we have a striking proof in the case of iron protochloride, which brings back the pyroxyline to the state of cotton (Pelouse gnd Fremy). We are also familiar with the fact that our negative collodion became glutinous and thick, or very fluid, according to the halogen salt used in its preparation. We now want a collodion with organic reactions for silver; but we must not overlook the fact that other organic reactions also exist giving great variety of effects, that the determination of these effects will advance our knowledge of this important branch of photography, and that a judicious choice of reagents, based on exprimental knowledge, will give a new power.

THREE METHODS FOR TRANSFERRING NEGATIVES.

BY E. BIERSTADT.[*]

In all cases the glass must not be albumenized, but cleaned thoroughly, and buffed with a chamois on which has been dusted a little finely powdered talc (tailor's chalk); the plate is then ready to be coated with collodion for the negative, which is to be made as usual, but not varnished.

For transferring the negative with gelatine, place it in a horizontal position, and warm it nearly as much as though it were to be varnished; then pour on the centre of it a hot solution of gelatine made as follows:—

French gelatine	1 ounce
Water	10 ounces
Glycerine...	¼ ounce

Spread this all over the negative with a piece of soft paper, and remove all bubbles, and allow it to dry. When thoroughly dry, cut through the film an eighth of an inch from the edge, and the negative can be peeled off easily.

To transfer with collodion, coat the dried negative with a solution of india-rubber in benzole about as thick as syrup; let this dry so that all parts of the plate look alike (this can be done by heat in a few minutes, or in ordinary temperature in two hours); place it in a perfectly level position in a cold place, and pour on a collodion made as follows:—

Ether and alcohol, equal parts.
Soluble cotton, 10 grains to ounce, with a further addition of 2 per cent. of castor oil.

Dry perfectly, and cut through the film all round near the edge, and lay the plate in cold water until the film comes off. Dry between sheets of blotting-paper

To Transfer a Negative from Glass to Paper (suitable for very Intense Line Work).—Before making the negatives prepare a solution of 1 ounce of transparent gelatine in 16 ounces of water and 10 drops of glycerine; keep this warm in a flat dish, and float sheets of thin paper of an even texture on it, in the same manner that paper is albumenized; hang it up to dry, and keep in a portfolio for future use. It will keep any length of time.

After making the negative, as usual, wash it and lay it in a dish of clean water; cut a piece of the gelatinized paper of the same size as the negative and float it on the surface, avoiding air-bubbles; when it lies flat, without curling, lift the negative up under it and hold the paper fast by two corners, and lift both together out of the water and set on edge to dry. When dry, lay it face n ! on a flat board, and with a warm, clean flat iron melt ane rub over some white beeswax until the paper is saturatedd while still warm, wipe off all surplus wax with soft papn or cloth, and cut around the edge and lay the whole ir cold water, and the negative is easily removed.

CARBON PRINTING.

BY D. K. GRIFFITHS.

The Editor of this journal has on frequent occasions warned carbon printers of the dangers attending a too careless use of the chromate salts, and, as in all probability, many fresh manipulators will be allured into adopting the carbon process from the undoubted advantage it offers in permanency and simplicity of working, my object now is to suggest a means of avoiding plunging the hands into the sensitizing solution during the operation, and hence the following very simple contrivance:—Take a plate glass of the size required for the pigment tissue, and to each of its corners adjust four pieces of fine-grained cork by slicing a small portion from the sides of each, and sticking the sharp corners of the glass well into them; then take the tissue, and, placing the pigment side downwards, fasten each of the corners to the pieces of cork with drawing-pins. So secured, place it upon a dipper, and plunge gently into the sensitizing solution, using the ordinary vertical dipping-bath, and removing the air-bubbles formed from the pores of the paper by a badger-brush; the liquid will flow quite freely over the surface of the pigment on the inside, and, after remaining in the bath the requisite time, remove glass and pigment with the aid of a forceps, and stand it aside to dry, using a glass for each sheet of pigment.

By this very simple means the tissue will be secured from the dust in the atmosphere, will dry sooner, and not the least trace of the poisonous compound need touch the fingers.

To develop, I think, no form of dish is more suitable than the *cuvette*, used by French manipulators, and which the Editor can best describe if he thinks it necessary.

Judging from the hitherto liberal action of the Autotype Company, I think they would scarcely care to endorse the sentiments your correspondent, "A Carbonist," expresses. All poor people are not necessarily "nasty" people, and possess as strong a natural affection as those in a more prosperous way in life; consequently, men must be found to supply their wants who will be satisfied with modest remuneration, and by all means let them be forthcoming, as well as the material for permanency, at prices consistent with good quality, so that the humblest may not be debarred of sharing its advantages, and then talent, if not genius, will step in and draw the line between the requirements of the lower and higher walks of life.

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[*] *Anthony's Bulletin.*

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PHOTOGRAPHY BY MEANS OF ASPHALTE.

In a German technical newspaper, *Ackerman's Zeitung*, a M. Fichtner gives some details of a plan for producing printing blocks, or phototypes, by means of asphalte; and he also, by way of illustration, exhibits some pictures produced by the process.

The asphalte that he employs is of such a nature that it will not melt at a temperature of 90° Cent., and dissolves with great difficulty in turpentine. This material he dissolves by the aid of a mixture of benzole and lavender oil, making use of the following formula:—

Asphalte	5 parts
Benzole	90 ,,
Lavender oil	10 ,,

The asphalte must be first of all distilled, to free it from matters which are not sensitive to light, and must be rendered free from water. The oils employed as solvents must, in like manner, be free from water.

A zinc plate—even, smooth, and clean—is carefully coated with the solution of asphalte just in the same way as collodion is applied to a glass plate, the superfluous liquid being allowed to run off at one of the corners, and the plate is then placed in a horizontal position to dry, in the dark, of course.

It is subsequently exposed under a stripped negative for a period of from 25 to 30 minutes in the sun, or three to four hours in diffused daylight, according to the sensitiveness of the asphalte, which is only to be determined by preliminary experiments.

The exposed plates are developed with petroleum spirit mixed with one-sixth its volume of benzole, the same being poured over the film, which is tilted to and fro. When the whites are quite clear, the plate is washed under a jet of water, and allowed to dry in the light.

Finally the plate is etched by means of dilute nitric acid, care being taken that no air bubbles are formed the while.

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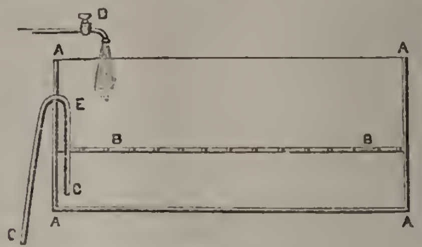
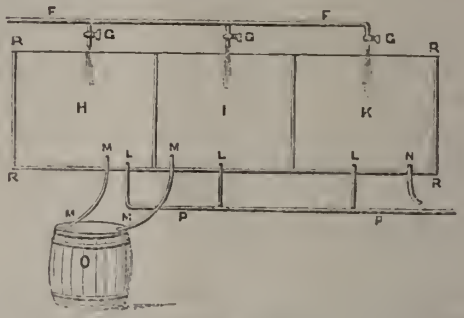
FIXING AND WASHING MACHINE.

BY WALTER CLEMENTS.

I send you a plan of my fixing and washing machines, which may not be new, but I have not seen them before. They are made of wood and lined with pitch. The top sketch is my washing machine, on which I can thoroughly depend, having any number of prints well washed without any trouble. A is a box, 32 inches by 24 inches, and 12 inches high. B is a perforated false bottom. C is a leaden pipe syphon. D is the supply tap. Having fixed your prints, turn on tap D, move the prints in the water to separate them a little, and by the morning they will be well washed.

The syphon C must be rather larger than the supply pipe D. You will find when the water gets just past E, the syphon will act and draw the water completely off, leaving your prints to drain on the false bottom; it will then fill and draw off again according to the supply. Now, as regards my fixing and first washings, R is a wooden trough 70 inches long, 24 inches wide, and five inches deep, divided into the three compartments, H I K. The supply pipe F, and taps G, the waste pipe P. The barrel O for the silver washings, and M, two pipes with plugs, leading from troughs H and I to barrel O. From the bottom of each trough are plugs L leading to waste pipe, and N is a plug with a short piece of leaden pipe. Having explained the troughs, &c., as well as I am able, I will proceed to tell you how I wash, tone, and fix. I turn on the taps at troughs H and I; half fill with water; I then put prints in H; well move them about, then put them one at a time in trough I. I then pull up plug M, to let silver washing run into the barrel; put prints back again into H, let silver washing out of I, then fill with water, and commence to tone. I tone in a porcelain dish, and as they are toned put them in trough I, give them a good wash, and fix in K; when fixed draw off hypo at N, turn water on after hypo is drawn off, give a good wash by well moving about, and then place in washing machine.





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A NEW METHOD OF INTENSIFYING BY MEANS OF LEAD.

BY J. F. EDER, AND VICTOR TOTH.*

It is difficult to find among the various intensifying processes one which will vigorously intensify a weak, thin image without fogging it, as in the case of an under-exposed negative of an engraving. Intensifying by the aid of mercury or uranium, which gives the most favourable results, probably, are in recent times rarely if ever employed, by reason of the unstable character of the film produced; and the ordinary silver process only permits a certain degree of density to be attained without injuring the clearness of the negative. For this reason it is customary to intensify in the first place with silver, and then to employ another intensifier, which will not fog the negative by its prolonged action, such, for instance as gold, platinum, sulphur, &c. Neither sulphur nor Schlippe's salts produces an unstable film, but then, unfortunately, they do not yield a very dense deposit unless silver is first of all employed.

With the intensifying solution which we propose, it is possible to produce more dense pictures even than by means of uranium and mercury, and the latter have the advantage of being perfectly stable. This process, which we have called the lead intensifying method, we will now describe.

The under-exposed negative, which has been kept clear in the light, is fixed, and then thoroughly washed, first with ordinary, and afterwards with distilled, water; it is then put into a filtered solution of—

Nitrate of lead	4 parts
Red prussiate of potash	6 ,,
Distilled water	100 ,,

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* *Photographische Correspondenz.*

and allowed to remain there until the blacks have become opaque.

If sugar of lead (acetate) is used instead of the nitrate (five parts in one hundred of water) the bath acts in the same manner, but has the disagreeable quality of becoming turbid on exposure to light, so that filtration becomes necessary. More dilute solutions than the above are slower in their action; thus one made of—

Nitrate of lead	1 part
Red prussiate of potash	1 „
Water	100 parts

answers very well, but takes a long time to effect its purpose. More concentrated solutions, on the other hand, crystallize out, often upon the negative itself.

If the lead intensifying process is employed immediately after fixing without allowing the negative to get dry, enough density is obtained in the course of a minute. A negative once dry, even when it is thoroughly moistened with distilled water, requires to be left in the bath a much longer time, and the process is often not complete before six or eight hours. But this is not a disadvantage connected with this process alone, for other intensifiers, Selle's salts and chloride of platinum, are quite as long acting upon dried films.

It is best, obviously, to undertake the intensifying as soon after fixing as possible, and if the negative should have become dry, it is left for a few hours in distilled water. One need not be frightened at the time required for the operation, for a weak negative which would otherwise be quite useless, becomes quite opaque after sufficient immersion in the bath.

On the development in the lead bath, there becomes deposited upon the picture a faint yellowish precipitate, which makes the picture appear white, and which possesses extraordinary opacity. It is necessary to allow the negative to remain so long in the bath until it has attained the desired degree of intensity, for the subsequent operation with sulphide of ammonium is best for the purpose of augmenting the opacity, so much as to render the film of a stable nature.

The action that takes place is similar to that with the uranium intensifier; the silver works as a reducing agent, transforming the red prussiate into yellow, which then enters into insoluble combination with the lead salt forming ferrocyanide of lead.

It is now a question of converting the lead compound into a stable and, perhaps, more opaque compound; this is done by the action of sulphide of ammonium.

After the negative has been washed with distilled water very thoroughly, it is poured over with sulphide of ammonium diluted in the proportion of 1 to 5 with water. When the negative has been washed enough, its colour assumes that of a pure white. If it is desired to know whether it is perfectly washed or no, a few drops of the washing water are allowed to fall into some developing liquid; if the latter does not become blue to any perceptible extent, then it is a sure sign that the washing has been most perfectly carried out. On the application of the sulphide of ammonium, the picture blackens instantly, and when this change has penetrated to the back of the picture, the ammonium solution is washed off with ordinary water. In this way the greatest clearness, as also the most intensely black opaque shadows, are produced. Intensifying with iodine, and subsequent treatment with sulphide of ammonium, is at present generally used by all photo-lithographers. It is a simple and most convincing experiment to intensify one half of a negative by this means, and the other half by our method; it will be found that the density in the latter case will be in the proportion of 3 to 1.

The solution of lead may be preserved for weeks, nay, even months. In time its action becomes less rapid, as a portion of the prussiate of potash is gradually decomposed, and then nitrate of lead and red prussiate should be added in the proportion of a quarter or half the original amount. It is well to filter the bath frequently.

Should the negative not have become sufficiently dense in the lead bath (even after a long sojourn therein), as sometimes happens in the case of very thin negatives, we have a means at hand whereby we can render them denser. This is sulphate of cadmium, to be obtained in commerce, of which a solution is made by dissolving some 10 grammes in 100 cub cents. of distilled water.

Into this bath is put the negative that has come out of the lead bath, and been well washed with distilled water, without permitting it to dry, as otherwise a long time elapses before the action of the solution exerts itself. The aspect of the picture does not alter, or only becomes at least of a purer white. The film is then washed with distilled water again, and is treated once more with sulphate of ammonium, after which it is finally washed with rain water.

The action of the cadmium salt is explained in the following manner:—The sulphuric acid in the salt combines with the lead in the picture, and the ferrocyanide, which was formerly associated with the lead, takes up with the cadmium, and likewise forms insoluble ferrocyanide of cadmium. Not only the lead, but also the cadmium, and the silver of the picture, is converted by the sulphide of ammonium into a metal and sulphur compound.

As sulphide of cadmium is, as is well known, of a yellowish colour, the negative treated in this manner with sulphate of cadmium is different to that furnished by means of the lead solution after final treatment with sulphide of ammonium, for, in case of the latter, the film is quite black. The opacity of the negatives intensified with lead and cadmium is in proportion to one intensified with lead alone, as 4 is to 3.

If the sulphide of ammonium is replaced by a solution of Schlippe's salts with ammonia in the proportion of—

Schlippe's salts	10 parts
Water	100 „
Caustic ammonia	5 „

the negative becomes of a pretty red-brown, and is a little more opaque than when sulphide of ammonium is employed. Nevertheless, we do not recommend the use of Schlippe's salts, as it is of such an unstable character, so that not only is the manipulation rendered more difficult, but it may give rise to a fogging action.

Finally, we may remark that we have been successful in imparting to the weakest of negatives the greatest opacity, while their transparent portions have been preserved, and it is very rarely indeed that any recourse to the cadmium bath has been found to be necessary. The lead intensifying process is particularly applicable to the preparation of negatives of drawings, plans, and engravings. Its advantages over other methods are obvious, and it is so simple and certain in its application that any non-success may be safely ascribed to insufficient bathing or incomplete washing of the film before the application of the solutions.

A Remarkable Apparatus for Deep Sea Sounding.—Dr. Neumayor has presented to the Geographical Society of Berlin a remarkable apparatus for deep sea sounding by means of photography. It consists of a brass box, hermetically closed, and having attached to it an apparatus resembling a vane or rudder. Within this box a thermometer and a magnetic needle are contained, behind each of which is placed sensitive photographic paper, and in front of which is a small nitrogen vacuum tube. The box contains also a small induction coil. When the apparatus is lowered to the required depth, the rudder causes it to take a direction parallel to the current there existing, and hence a definite direction with reference to the needle within. The thermometer soon acquires the temperature of the water outside, and becomes stationary. At this instant an electric current is sent to the box, which, by means of the induction coil inside, lights up the little nitrogen tube, the violet light of which, photographically very intense, prints in about three minutes the position of the needle and the height of the mercury column upon the prepared paper. The current is then intermitted, the apparatus raised, the photographic tracing fixed, examined, and placed upon record.—*The American Stationer.*

The Photographic News.

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LIGHT AND HEALTH.

That an intimate connection subsists between light and health, and between darkness, disease, deformity, and debility, has long been held by physiologists; but the definite relation established by Mr. Winstanley between the daily variations of a particular disease as recorded by the Manchester officer of health, and the daily variations of the amount of actinic light ascertained by carefully-conducted experiments, places the question on a footing very different to that attained by general observation. It does not come within the scope of our duties in this journal to indicate the possible applications of this definitely-ascertained law to the purposes of sanitary or therapeutic science, but a few reflections on its bearing on the habits and health of photographers may not be uninteresting.

It is very curious to note to what a slight extent the somewhat indifferent and careless recognition of a fact based upon general and indefinite observation affects the action and habits of mankind. The beneficial sanitary effect of light has been affirmed from the time of Hippocrates. A common notion prevailed in ancient times that disease—"the pestilence which walketh in darkness"—was generated in the night-time, and declined when the sun rose, *levato sole levatur morbus* being an old medical axiom. An old Italian proverb affirms that the physician must enter a dwelling if light be excluded. Cretinism has long been attributed to residence in valleys into which the direct solar ray rarely penetrates. The full development of vitality, alike in animal and vegetable life, is prevented by darkness. The development of tadpoles into frogs has been arrested when placed in darkness for several months. Every gardener knows that plants deprived of sufficient light grow up weak and straggling, rarely having sufficient vitality to bloom. Of late years the influence of light on health has been frequently affirmed by authorities. Dr. Forbes Winslow says, "Where light is not permitted to permeate, there are found, in the highest state of manifestation, bodily deformities, intellectual deterioration, crime, disease, early and often sudden death. A material as well as moral and mental etiolation or blanching occurs when the vital stimulus of light is withdrawn." "Light," says Sir David Brewster, "is the very life-blood of nature, without which everything material would fade and perish." Physician and philosopher alike have dwelt upon this fact as a general truth, and, like most merely general statements of a truth, it has attained little practical attention. Within the memory of every man of middle age a paternal government, solicitous of the welfare of the people, placed a premium upon debilitated, imperfectly-developed forms, upon pale, flabby, anœmic faces, by imposing a window-tax, thus making the free admission of light into houses costly, if not penal. And up to the present moment a single thought of the sanitary value of light probably never enters the mind of anyone in building, furnishing, or managing a house.

In estimating the effect of photography upon the health of its devotees, this question is by no means an unimportant one. In the studio the operator is perforce subjected to the beneficent influence, a privilege which, rightly controlled, may possess great value. Dr. Andrew Wynter, writing on the valuable effect of light in the healthy development of young people, says:—"When we see the glass rooms of the photographers in every street high up on the topmost storey, we grudge them their application to a mere personal vanity. Why should not our nurseries be constructed in the same manner? . . Glass-house nurseries would save many a weakly child that now perishes for want of those necessaries of life—sunlight and oxygen." Dr. Wynter here indicates the primary condition of importance in utilizing the sunlight for the purposes of health: it must be accompanied by oxygen; the glass-room must be well supplied with fresh air, perfectly ventilated. The *solaria* of the ancients, or "solar air baths," were terraces built on the tops of the houses, where the body could be freely exposed to the air and sun, the beneficial effect of such baths being held in high esteem. Perfect ventilation, added to the plentiful supply of light, should render a photographer's studio one of the most healthy of places. But there are other conditions of importance also to be remembered. The rapid transition from bright light to extreme darkness, and *vice versa*, is always in greater or less degree injurious to the eye, and often immediately painful. It is related that a form of torture adopted by the tyrant Dionysius consisted in compelling his victims to continue passing rapidly from extreme darkness to brilliant sunlight. Weak sight, and temporary blindness, is sometimes the result of such a course. The use of a dark-room with abundance of non-actinic light will effectually prevent this danger. Continued life in the dark-room, which is in the case of some operators and assistant operators almost inevitable, cannot under any circumstances be conducive to the highest conditions of health, involving as it does protracted submission to imperfect light, and more or less injurious vapours. But perfect ventilation, and a full supply of non-actinic light, will reduce the injurious effect of these conditions to a *minimum*. An incidental caution to photographers may, whilst referring to the influence of light, be offered, although it should be scarcely necessary. It is wise to avoid a bright object for the sitter's eyes. If possible, he should look into a shaded part of the studio, at something not brilliantly illuminated. Dr. Hammond states that he knew of a child who was rendered permanently blind by looking intently at a bright object during a protracted sitting for her photograph. This is a risk which can, we imagine, be rarely incurred; but, apart from the risk, a much more pleasant expression would be secured by adopting the course we have just suggested; and further, as the pupil contracts in a strong light, the eye is made to look poor and small; whilst expanding in a dull light, a full dark eye is secured by allowing the sitter's eyes to be turned from the light, and fixed on a very slightly illuminated object. The varied definite considerations legitimately arising out of Mr. Winstanley's experiments will, we hope, commend themselves to students of sanitary science. We have merely thrown out two or three suggestions, which may be of technical interest to our readers.

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FARGIER'S CARBON PROCESS.

According to the *Moniteur de la Photographie*, Fargier's new carbon process may be summed up in a few words. A sheet of paper is allowed to float upon a solution of five grammes of chloride of iron and a similar amount of citric acid, which are dissolved in one hundred grammes of water. This paper is afterwards dried in the dark, and placed under a negative to print, until a weak image is produced.

This print is taken and floated upon a bath of coloured gelatine solution, when it is found that the gelatine attaches itself to the portions of the surface that have been acted upon by light. There remains nothing but to wash the sheet in water, and the picture is finished.

If, instead of a coloured solution of gelatine in water, softened tissue were employed, the printed chloride of iron paper being pressed into contact with the same, warm water being used subsequently to separate the two surfaces again, there would perhaps be a step further gained in the simplification of the carbon process, for the pictures would be visible at once during the printing operation, and could therefore be controlled.

Dr. Liesegang, writing in the *Archiv*, is of opinion that an improvement in the carbon process may be effected in this direction, and that the Fargier method indicates a branch of the subject which might be investigated with advantage.

DR. STEIN ON SPIRIT PHOTOGRAPHS.

At the Society for the Advancement of Photography, which has but recently been established at Frankfort-on-the-Main, Dr. Stein lately gave a lecture upon his experiences of spiritualism in Brussels, which proved particularly interesting by reason of its bearing upon photographic matters.

Dr. Stein's remarks bore reference to the detection of certain spirit photographs of a spurious character. As is well known, the spiritualists, Leymarie and Firman, as also the photographer, Buguet, have recently been sentenced to imprisonment in Paris for perpetrating some so-called spirit photographs. Buguet confessed before the Paris tribunal his imposition, and acknowledged that the pictures produced in conjunction with Leymarie and the American Firman were deceptions. Two confidential agents of the Spirit Congress, Messrs. C. H. Fritz and Augustine Boyard, had an interview with Buguet at the office of the French Consul, and Buguet then publicly stated that the confession he had made had been wrung from him by the Paris tribunal, and that his three hundred dolls' heads had been made use of by some of his assistants while he himself was ill. Two-thirds of his spirit photographs, he avowed, represented true spirits, which really had stood beside the people pourtrayed, and the latter had sworn to the resemblance of these spirits to their friends, &c. Buguet also stated that his statements regarding Leymarie and Firman during the trial were all false, and that these gentlemen were in truth honourable mediums.

Leymarie expressed his innocence at the Brussels Spirit Congress, and said he must have been deceived by Buguet. After the former had declared his good faith before the assembly the president stated that a member of the International Medicine Congress was present, who had proved by experiment that it was possible to photograph spirits, and that the latter had done so, and thus he had established the circumstance from a scientific point of view. This investigator, who was present, the president stated, was Dr. Stein himself.

The latter of course at once rose, and stated that the president of the Congress was altogether in error in supposing that he (Dr. Stein) had accomplished the result in question; on the contrary, he had been successful in demonstrating in the photographic studio of a highly-honourable and personal friend of his, who was a believer in spiritualism, that the results of M. Buguet and his colleagues were simply deceptions, and nothing more.

Dr. Stein said that he placed before the gentleman in question in the dark room a photographic plate which they had previously seen cleaned with nitric acid, and which had no trace of an image upon it. The plate was, in the presence of all of them, put into the dark slide, after preparation, and from the dark room transported to the studio and to the camera, before which a spiritualist was sitting who desired to be photographed with a spirit. The medium who was present, an old English sailor, just before the picture was focussed, had made a communication that beside the sitter he could see a young maiden with flowing hair, but this apparition none of the others could observe. The plate was exposed, the image developed and fixed in the ordinary way, and, behold, there appeared beside the picture of the model, a dull outline of a beautiful young girl with her hair falling over her shoulders. The spiritualists were in raptures, and their feelings overcame them so at the phenomenon they had witnessed that they actually trembled. "Ah! ah! here is proof of our assertions; a proof, too, from a man worthy of belief," they cried.

How was this photograph produced? It is well known that the photographic image, even when the light has already acted upon the plate, is invisible or latent. Dr. Stein had, in the presence of one of the gentlemen only, without the other's knowledge, immediately after the exposure of the plate, rapidly printed the latent spirit photograph upon the glass by means of an artificial light, and then developed the two images, and produced them together. The result was so much in accordance with the anticipations of the spiritualists that these gentlemen were at once deceived. The original of the spirit photograph Dr. Stein had rapidly selected from a hundred plates, which were ready to hand in a rack above his head, it being the negative most nearly corresponding to the dictum of the medium.

Afterwards, Dr. Stein explained the whole matter, and drew from his pocket the negative which served for the printing in of the ghostly image; the spiritualists were for the moment sorely puzzled, but in the end maintained that the truth was as they at first declared, and that they could see beyond this second picture a third ghostly image, which, however, Dr. Stein (so they said) failed to observe, because he wished to persist in his disbelief.

This third ghost, of which, indeed, nothing at all was to be seen upon the plate, at last resolved itself into certain yellow spots visible upon the film; and Dr. Stein, for this reason, asked permission to make another experiment the next day. But on the morrow, although the assembled spiritualists had another mathematical proof placed before them in the shape of a plate in which no vestige of a ghost or spirit could be traced, the gentlemen refused to stir from their former belief. They separated with the consolation that the spirits were not in the mood just then to be photographed.

Dr. Stein pointed out to the audience at the end of his lecture, that such spirit photographs might be secured in various ways; thus they may be obtained by printing in a latent image, by taking a second person on the same plate as the sitter, or, as was the case in Paris lately, by having recourse to suitably dressed dolls, which were photographed before or after the sitter.

ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

The Platinum Printing Process—Permanency of Carbon Prints—Cost of Carbon Printing—India-rubber Lined Baths—The Photographic Society.

The month has been pregnant in matters of photographic interest; but they will be for the most part too well remembered to need echoing. In the first place, Mr. W. Willis courteously affords some further information regarding his platinum printing process, and expresses his belief that only through a misconception of the nature of the prints can any doubt exist as to their permanency.

The production of permanent photographs has become such an imperative necessity to all interested in the reputation of the art that any feasible claim for permanency in results is sure to meet with earnest attention, and if Mr. Willis can make good his claim, there is a large section of photographers who will gladly avail themselves of his discovery. But he must pardon me if I point out two or three sources of doubt, which must shake the confidence of many photographers. He states that silver does not necessarily enter his process; but the fact is, he does use it. He further states that no silver exists in the finished print; and that hypo is not absolutely necessary, but that it is used. In many respects his claims are very similar to those made for the Wothlytype process, when it was first introduced. It was alleged that although silver was used in the process, there was none in the finished print, which consisted solely of one of the noble metals. The prints produced were charming, but they faded. The contact between hypo and silver, and the possible formation of an insoluble hyposulphite of silver, the presence of which inevitably jaundiced the print, occasional examples of fading created doubt, and a beautiful process was soon abandoned because it was more troublesome and no more certain than ordinary silver printing. I shall hope for some occasion of availing myself of the courteous offer of an opportunity to examine and test the prints. In the meantime, may I suggest to Mr. Willis that he would do wisely to submit examples and information to our Editor, who would doubtless give the matter some attention. I have looked in vain for any notice of the results or details of the process, beyond these given in the specification in the pages of the News, and to the majority of its readers the existence of the process is barely known.

The subject of permanency is manifestly exercising the photographic mind at present, and as the advent of carbon printing seems imminent; photographers are naturally demanding a very definite answer as to the claims of carbon prints to permanency. The questions I ventured to suggest on this point a month ago have evoked varied expressions of opinion on the subject, many of your readers having manifest sympathy with the doubts expressed. Having raised the question, perhaps I may, without impropriety, briefly state the case as it seems to stand. There is abundant evidence that many carbon prints have not retained their pristine beauty: the first bloom, which gave delicacy and brightness to the print, has gone, and in some cases a greenish tint has become apparent in the half-tones. There are two important lessons suggested here. The first concerns patentees and manufacturers of tissue. Photographers are very much in the hands of these gentlemen. In the first place, it would never answer the purpose of individual photographers to make their own carbon tissue; and in the next place, they would not be permitted, I believe, by the patentees to do so without payment of licence fees. Photographers must accept the tissue provided for them; but this very fact, as well as every consideration of policy, should bind the manufacturers to use pigment, the permanency of which is beyond question. I know that in the early days of the process it was a matter of anxious experiment with both Mr. Swan and Mr. Johnson, to secure rich photographic tints without the use of fugitive pigments. That some manufacturer has used fugitive pigments, probably carmine, to add to lamp black, and so secure warmth and brilliancy, is manifest from some of the faded specimens described. That it is suicidal policy in any one interested in carbon printing to send out such tissue, scarcely needs affirming. The second cause of fading or discolouration is very easily discovered, and very easily avoided. It is due to imperfect washing, to remove all traces of unchanged bichromate. The remedy is obvious and simple. There is, of course, a tendency to coldness in the tint, produced by the oxide of chromium, to the presence of which insolubility in the gelatine is due; but the pale-grey-green tint thus produced should be taken into account in preparing the tissue. Such coldness, when present, is, moreover, manifest when the print is produced, and cannot be regarded as the result of change or fading. The splitting or exfoliation of the early prints made with a collodion tissue does not require consideration, as that mode of working has long been discontinued.

The fact, then, that unstable results may be produced by the carbon process cannot be doubted. But I should be very sorry if a single word from my pen encouraged the idea that carbon printing was not a permanent process, in the ordinary sense of the word. No one would doubt the permanency of oil painting as a process, and yet it can be conducted so as to give unstable results. Many of the works of Reynolds, Wilkie, Turner, and other masters of the last hundred years, are in a most deplorable condition of decay, the result of using untrustworthy pigments and vehicles. A mania for securing some facilities in working, and some fancied beauties in result, prevailed; and these masters, unfortunately, experimented, not on a vile body, as the classic axiom would suggest, but on works which should have been immortal! But all this is no argument against the permanency of legitimately-produced oil paintings. The difference between carbon and silver appears to be this: a properly produced carbon print may certainly be pronounced permanent, whilst no such conclusion can be affirmed of the most carefully produced silver print.

Regarding the cost of carbon and silver printing, it is, doubtless, a little too early to enter into comparative estimates, as carbon, as yet, is considerably handicapped by lack of general experience. It is impossible not to sympathize with Mr. Bovey in his anticipations of loss for many interested in the maintenance of silver printing. Mr. Bovey knows as well as any one that the tide of progress will not be stayed in obedience to a protest. He simply says, in effect, to photographers, "Pause: and be quite sure of the reality of the improvements, before you rush into a process which will injure, if not ruin, many of us!" Of course, if a man be ruined by some innovation in the trade by which he makes his living, it is small consolation to him to be told that his ruin is in strict accordance with the laws of political economy. But whilst I can see much probable inconvenience, and, possibly, some temporary loss to many small photographers, in the change from silver to carbon, I do not think there need be any fear of ruin to enterprizing men. The change, as you pointed out in a recent leader, and as the Autotype Company in their excellent letter suggest, if inevitable, will be very gradual, and will so afford time to compound with circumstances.

The india-rubber lined dipping bath—to which some attention has been directed lately—is a very old friend of mine. I used one a score of years ago, and on one occasion made a moderately effective one myself. A piece of yellow pine answers perfectly, and is lighter than mahogany. The front and back were about a quarter of an inch thick, and the sides and bottom about half an inch thick; the latter being made to fit in between the front and back. Pieces of thin sheet india-rubber, the full size of the outside of the front and back, were attached with a little india-rubber cement, and pieces were cut large enough to wrap round the edges of the sides and bottom. When the pieces were brought together, it would be seen the joints contained a double lining of the india-rubber, and being screwed together with brass screws, the elasticity of the india rubber then pressed together in the joints, made the vessel perfectly water-tight, and gave a light, servieable, cheap bath.

The Society meetings during the month have been interesting—I might add, in some instances, amusing. The spirit of optimism which you noticed as prevailing at the annual meeting of the parent society was certainly amusing. Everybody was prepared to congratulate everybody else, and to join in the most charing of anticipations. This is certainly much more pleasant, at least, than the prevalence of fierce antagonisms. This spirit was carried too far, however, in the statement that the late exhibition was an unprecedented success, that no previous exhibition had attracted so much attention from the non-photographic press, and, that financially, it yielded a profit. That the pictures were exhibited in a handsomer room than usual was probably the one circumstance in which it could take priority of previous exhibitions. The pictures were certainly not superior, as a whole, to those exhibited for the last few years, whilst there was a marked absence of pictures of surpassing excellence, and many of the most distinguished photographers who have exhibited in former years were conspicuous by their absence. The notices of the public press were neither more numerous nor more laudatory than usual, several of them complaining of the stagnant, commonplace tendency in the art which the exhibition seemed to indicate. Financially, several of the recent exhibitions have been self-supporting, whilst this was clearly a financial loss. I find in the treasurer's account the statement that the amount received for admissions and catalogues, or journals, was £137 1s. 9½d. Where a halfpenny occurs in admission-fees or sale of journals, is not quite apparent; but that is not a matter of moment. How much this amount would be reduced by deducting cost of journals or catalogues I do not know; but I presume that item forms part of the journal account, and is not included in the "expenses of the exhibition" set down at £132 12s. 6d. But we have a separate item—"Soiree expenses at the opening and closing of the Exhibition, £30 15s. 3d." This item has in former years been included in exhibition expenses, and, so treated, this year the exhibition would show a heavy deficit. The holding of an annual exhibition is one of the best things the society does; but it is important to remember that the yearly increasing loss on exhibitions a dozen or more years ago compelled the society to abandon them altogether, and one would be sorry to see such a risk incurred again, if by good management the self-supporting character of the last few years could be retained.

The amusing *naivete* of the President in announcing the necessity of altering the rules, so as to practically restore the old system of a house-list, one of the chief points to which the requisitionists took objection in the war of a few years back, and the cordiality, not to say unction, with which Mr. Hughes, the chief opponent of the President on this very point, proposed a vote of thanks, were refreshing in the highest degree. But for the criticisms and prophesies of Mr. Hooper, who was out of harmony with the spirit of optimism which prevailed, and but for the ridiculous effect of the weakly splenetic interruption of some one who wished the Chairman to stop Mr. Hooper's remarks, because they were not pleasant, the meeting would have been delightful throughout. Seriously speaking, there appears a strong desire to bring the Society into a position of influence and usefulness, and this end will be aided rather than retarded by honest, outspoken, if unpalatable, criticisms like those of Mr. Hooper.

REPRODUCTION OF ENGRAVINGS.

BY COUNT LODOVICO DE COURTEN.*

Amateurs who are not fortunate enough to possess a glazed studio, and often have not even an uncovered terrace at their disposal, are compelled to make their reproductions of engravings, drawings, &c., or of any other flat design, in the vicinity of a window. The difficulty of operating is very great when one attempts to work in museums and picture galleries, and any hint, therefore, which will facilitate one's labours is not to be despised. One of the principal defects when the object is opposite a lateral opening consists in the inequality of the lighting, the side nearest the daylight being much more brilliantly illuminated than the opposite side; and as it is necessary, in order to get at the proper distance, to place oneself on one side, at a very wide angle, it follows that a lengthened pose is necessary. Direct sunlight permits of the reduction of these defects to a minimum. Unfortunately, one cannot always place the camera to the best advantage on the proper side, and the sun as it rises soon deprives one of the advantages one hoped to gain.

There is, however, a method of getting out of the difficulty, which consists in the employment of ordinary mirrors of quicksilvered glass. They reflect most of the incident light which is necessary to the purpose. A surface measuring forty by fifty-five centimetres will answer wonderfully well. This mirror is held in the hand, and during the exposure the rays of light are directed upon the object to be reproduced, care being taken to oscillate the surface a little so as thoroughly to equalize the illumination. The exposure is very rapid under these circumstances.

By employing two mirrors instead of one, the rapidity is doubled, and any inequalities in illumination are destroyed in the most effectual manner. Even in the case of a pose in direct sunlight, the shadows may be advantageously combated which are formed by a rugged or uneven surface. The great simplicity of the method, and its incontestible utility, are enough to recommend it.

It is by employing large mirrors in this way, reflecting upon any given surface, that details and minutiæ badly lighted up are reproduced on the frescoes at Florence. Therefore, in the reproduction of engravings, the same plan would be advantageous.

Correspondence.

SUBSTITUTE FOR GROUND-GLASS.

Dear Sir,—Will you allow me space to describe a simple method of making a very fine imitation of ground glass, which is unequalled by any I have ever used. The grain of the surface is so fine that it is a pleasure to focus with it after using the ordinary screens. I have used it now for twelve months, and do not care to use any other. I wish it to be understood that I do not claim to be the first inventor of it, for I would not lay myself open to the snubbings which seem to come from all quarters when anything new is suggested. The fact of its being made so simply will suggest numberless uses for it.

Take a piece of good flat glass the size required for the focussing screen, and, after having well cleaned it, coat it with negative varnish possessing a good body (white hard varnish diluted with an equal quantity of methylated spirit, I use), the same as varnishing a negative; let it remain all night in a dry place to get thoroughly hardened. Then grind a small piece of resin to a very fine powder: take up a little on the middle finger, and rub on the varnished glass, commencing in the centre, with a circular motion, and gradually widening the circle until the edges of the glass are reached; then rub the corners in the same direction, dust gently with a dusting-brush, and you have a ground-glass fine enough for any purpose.

I have sent you a small plate so that you might see what a perfect surface it has.—I am, yours, &c.,

Walter Gardner.

[Nothing could exceed the example sent as a substitute for ground glass of the utmost delicacy.—Ed.]

SYPHONS, ETC.

Sir,—In a recent impression of the Photographic News, "E. L." refers to paper-sensitizing baths or dishes; the syphons that have been spoken of in the News apply to negative baths. Nothing is easier than to place a glass funnel in the mouth of the stock bottle, and empty the paper bath into it, in the way described by Mr. E. L. Mine, like his, is a half-sheet dish or bath, and I empty it in the exact same way as he does, for the reason that nothing is simpler. But emptying a negative bath is another thing, which to empty neatly requires, I think, a syphon of some sort.—Faithfully yours, sir, PETER SIMPLE.

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* *Moniteur de la Photographie.*

Chepstow, Feb. 26.

PHOTOGRAPHIC USE OF THE RADIOMETER.—DARKNESS AND DISEASE.

DEAR SIR,—Have any of your readers made any experiments with Mr. Crookes' beautiful little "light-mill" as a photometer? I was gratified a few evenings since in having the opportunity of handling one of these instruments, and learnt that they can be had at Browning's, or a couple of guineas each. The light of a common candle at a few inches' distance gave considerable speed to the revolutions of the wheel, decreasing, as the light was withdrawn, in exact ratio with the square of the distance. It has occurred to me that this little instrument would be very serviceable in cases of enlarging; indicating, by the number of revolutions, the proper exposure. It might be kept in action by those outside beams not actually used in producing the picture, or the rate of revolution having been guaged at the outset, the rest might be calculated. It would be very interesting to know the relative speed attained under different coloured lights, and also whether light apparently weak, and yet actinically powerful, exerted a force proportioned to its apparent or actual properties. If some of your amateur readers having a couple of guineas to spare, some leisure, and an inclination to benefit their busier brethren, would undertake some experiments, I am inclined to think much good might result.

I have just read Mr. Winstanley's interesting paper on "Light and Disease;" with the conclusion that darkness is more or less injurious to the human system if prolonged, which, in common with the majority of medical men, he gives his adhesion to, I think there can be no difference of opinion. Whatever that subtle force may be that, falling on the vanes of Mr. Crookes' mill, impels it on, it is certain that when carried to the human frame, in the "glad sunlight" it cheers, drives away "vapours," and quickens and vivifies the whole man, reaching, as Mr. Winstanley hints that he intends to show us, not only to the body, but through the body to the mind. In examining his table, however, I cannot help thinking that the connection of the beginning of lung disease with the presence of dull days and overcast skies may be found in a more familiar cause than the one he indicates, viz., that these are the days also for the most part of easterly or blustering winds, and almost always more or less chilly days, when "catching cold" is almost sure to occur to people of other than the most robust frames. It would be interesting, as well as assisting to substantiate or otherwise Mr. Winstanley's view, if the readings of the direction and force of the winds on the days of highest and lowest register were obtained, and put on record. I think, in conclusion, we are all deeply indebted to Mr. Winstanley for his careful and most useful registrations, whatever theories may be hung upon them.—Yours truly, R. H. P.

URANIUM IN THE NITRATE BATH.

MY DEAR SIR,—Not seeing any account from persons trying uranium in the bath since Col. Stuart Wortley told us how it should be prepared, I send you a line to say what Mr Blanchard and self did a few days ago. We took a good working 80 ounce bath, almost new and very little used; we divided it into two; in one we put 10 grains of uranium per ounce. We did not find that it shortened the exposure, that it did not hurt the bath, and we preferred the tone of the negative so much that I have continued using it for my present work—camera printing—but it is now too acid, made so by nitric acid; but as soon as I get some uranium I shall add it to my bath for negatives.—I am, dear sir, yours faithfully, W. PETERS.

The Bungalow, Horsham, Feb. 21.

P.S.—We found an addition of bromide in the collodion necessary.

PERSPECTIVE IN THE CAMERA.

DEAR SIR,—There have been many lessons on perspective published in your paper, but I should imagine they have been passed over by many photographers as being of little or no importance. If more attention were given to such as Dr. Vogel's "Treatise on Perspective in Photography" there would not be so many unsatisfactory portraits and views produced. Lenses are often said to be at fault as giving great distortion, when it is the operator who is to blame, or it may not be a fault, but true perspective. If a lens gives straight lines it does not distort, *even* if the lines are not quite perpendicular. If straight lines are at all inclined to curve, then the lens is at fault. A spirit level should be used by every photographer, especially in taking architecture. In this I do not mean to go over ground that has been gone over by many more scientific men, but simply to point out some new. At the present it is acknowledged, even by drawing masters, that a perfectly round ball is round at different angles (this is of great importance to photographers). As I say, it should not be so either in drawing or photographs. This is a strange but true assertion, and will undoubtedly be corrected in all books on perspective before long. For the photographer to prove it, simply place a ball directly in front of a wide-angled lens, take a negative at a distance of about four or five feet between lens and ball, then, without moving the camera, place the ball about two feet to the right or left of its first position, just far enough to get it to the extreme edge of the focussing glass. Now take another negative in this position, using the largest plate the camera will take, compare the two, and you will see the decided oval shape of the last. The more and more over you get, the more it will show. Moving it above or below the point of sight will elongate it the opposite way. This is not distortion, but *true* perspective. I feel sure that there is sufficient in this subject for a few gentlemen to give a little time and study to. I intend making several other experiments on the same subject.—Yours very truly, JOHN COWELL.

PRODUCING RELIEF BLOCKS.

SIR,—In your last issue, under the heading "Talk in the Studio," mention is made of a process (pretended German) called preparation of relief blocks from photographs for getting surfaces to be printed by letter-press process.

I have the pleasure to inform you that such a process, with little variation, has been long ago put in practice in this country, and in France.

Myself, as an amateur, have produced tolerable specimens which I shall be happy to show to any of your readers who may feel an interest in the matter. You are at liberty to insert this communication if you wish to do so.—Yours respectfully, G. ROUSSEAU.

3, *Hoe Street, Walthamstow, Feb.* 24.

CHLORO-IODO-BROMIDE WASHED EMULSION PROCESS.

SIR,—In the YEAR-BOOK OF PHOTOGRAPHY for the present year is printed a description of my chloro-iodo-bromide washed-emulsion process. Allow me to correct an omission in it. The direction should have been to add the cupric chloride after (above an hour after) the sensitizing with silver nitrate. That this omission had been made attracted my attention a few days after writing out the process, and I at once sent a correction, which appeared in the *British*

Journal for April 23rd, 1875, two weeks after the first publication of the process itself. I had previously, on more occasions than one (for example, March 12th), mentioned the necessity of this course with cupric chloride.

The variability of commercial cupric chloride led me (also in April last) to abandon its use, and substitute *cobalt chloride;* this was, if I am not mistaken, its first use in emulsion work. When the cobalt salt is used, it is probably of little importance whether it is added before or after the silver. This is a point which I have not examined, but having been in the habit of adding it last, in the case of the copper salt, have continued to do so with the cobalt. I may also add that I find the best time for keeping the emulsion before use, to be twelve hours.—I remain very truly yours, M. Carey Lea

Philadelphia, Feb. 15th.

EXPLOSIONS IN GAS BAGS.

Dear Sir,—Your correspondent, Mr. J. Rolls, has strangely misread the article to which his letter in your last week's issue refers. Mr. Rolls writes as though I had been guilty, or unfortunate enough, to produce the wreck of a drawing-room by means of a gas explosion to which I referred.

If he will read the article again, he will see that the only concern I had with the matter was in being called upon to give an explanation of the cause of the explosion mentioned.

It is quite common to use a precaution against the explosion of gas-bags, involving the principle of Mr. Hoffs' suggestion, namely, the principle of the safety lamp. "Hemmings' Safety Jet" is constructed on this principle: it consists of a tube, stuffed with fine wire, and is interposed between the bag and jet; the gas has to traverse the interstices of wire in this tube before it can pass from the bag to the jet, and the cooling effect of the mass of wire is too great to permit of the flame passing back to the bag, so that even if the bag were to contain an explosive mixture, there would be comparatively little risk of explosion. But, although Hemmings' safety tube is a thousand times more effectual in barring the passage of the jet flame to the bag, yet it is obviously still much safer not to have an explosive mixture in the bag at all.—I am, &c., Joseph W. Swan.

Underhill, High Fell, Gateshead-on-Tyne, March 1.

DRY PLATE WORK.

Dear Sir,—As the season is approaching when "dry-plate" work will be of the greatest interest, it will be of advantage to the many, if those who have made any experiments during the past year would give their testimony to those plates which they have found most reliable. I for one, after using all sorts of formulæ, and trying the many suggested by your correspondents, have always to go, if I want *reliable* ones, to the "beer and albumen." I would fain use the emulsions so recommended by advertisements as being so little trouble to prepare; the only objection I find is that I cannot get pictures with them.—Yours truly, Alpha.

SENDING SPECIMENS.

Sir,—Will you permit me, through the medium of your columns, to call attention to a practice prevalent among photographers, which is the cause of considerable inconvenience and annoyance to operators? I allude to photographers who require operators asking for specimens and references. A competent operator, who may advertise at the commencement of a season, is almost certain to receive a number of answers (I received, on one occasion, twenty-eight, and I know another who received as many as thirty-two). In most cases those who write ask for specimens as well as references. Supposing the advertiser wrote to six only among the applicants, it is most likely he would not have sufficient specimens to send to more than two or three of the number, and when those who receive specimens are so unbusiness-like and careless as to keep them three or four days, as is generally the case, it is extremely annoying, and augurs anything but a consideration of the convenience of the operator who is at some pains to obtain specimens. Cannot employers be satisfied with the reference of one or more other employers concerning the operator who seeks a situation? Moreover, it often happens that a man who has held several first class appointments is asked by some second or third-rate photographer for specimens.

Bedford, February 15th. J. P. S.

LIGHT AND HEALTH.

Dear Sir,—Apropos of Mr. Winstanley's interesting remarks on the relationship alleged to exist between darkness and disease, I enclose a "cutting" from a daily newspaper, the contents of which show that the matter which Mr. W. has reduced to experiment is at this time occupying the attention of eminent French *savants.* Readers of the News will probably remember that I directed attention to this subject about eight years ago, but instead of attributing the solar influences on health to relative dark days and light, I stated my belief that these changeful influences were regulated by the presence or absence of actinism, and I have since substituted for this latter term the more correct appellation of the magnetic rays. Accepted ideas concerning the physical nature of solar light will doubtless soon have to be changed, and it is pleasing to note that whenever that change is completed, it must be accredited to observations primarily undertaken with a view of improving the art of photography.—Yours, &c., W. T. Bovey.

"The idea of studying the disturbed state of lunatics in connection with magnetic perturbations and with the coloured, especially violet, light of the sun is of remarkable importance, and I consider it well worth being cultivated.' Such light is easily obtained by filtering the solar rays through a glass of that colour. 'Violet,' adds Father Secchi, 'has something melancholy and depressive about it, which, physiologically, causes low spirits; hence, no doubt, poets have draped melancholy in violet garments. Perhaps violet light may calm the nervous excitement of unfortunate maniacs.' He then, in his letter, advises Dr. Ponza to perform his experiments in rooms the walls of which are painted the same colour as the glass panes of the windows, which should be as numerous as possible, in order to favour the action of solar light, so that it may be admissible at any hour of the day. The patients should pass the night in rooms oriented to the east and the south, and painted and glazed as above. Dr. Ponza, following the instructions of the learned Jesuit, prepared several rooms in the manner described, and kept several patients there under observation. One of them affected with morbid taciturnity became gay and affable after three hours' stay in a red chamber; another, a maniac who refused all food, asked for some breakfast after having stayed twenty-fours in the same red chamber. In a blue one a highly excited madman, with a strait-waistcoat on, was kept all day; an hour after he appeared much calmer. The action of blue light is vere intense on the optic nerve, and seems to cause a sort of oppression. A patient was made to pass the night in a violet chamber; on the following day he begged Dr. Ponza to send him home because he felt himself cured, and indeed he has been well ever since. Dr. Ponza's conclusions from his experiments are these:—'The violet rays are, of all others, those that possess the most intense electro-chemical power; the red light is also very rich in calorific rays; blue light, on the contrary, is quite devoid of them, as well as of chemical and electric ones. Its beneficent influence is hard to explain; as it is the absolute negation of all excitement, it succeeds admirably in calmihg the furious excitement of maniacs.'"

Proceedings of Societies.

Edinburgh Photographic Society.

The second popular meeting of the season took place in Queen Street Hall, on Wednesday, the 9th inst., when the Hall, as usual, was quite full.

The exhibition consisted of a series of views of Paris, before and after siege, and was highly successful, many of the pictures being received with repeated rounds of applause.

The descriptive lecture was delivered by Bailie Marshall, who, in addition to a thorough acquaintance with the gay city, possesses a large fund of humour, which was largely drawn upon during the evening.

Votes of thanks were awarded to the Bailie, and to Lieutenant Gilbert, by whom the pictures were kindly lent.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The next meeting of this society will take place on Thursday, March 9th, in the House of the Society of Arts, Adelphi, when Mr. W. T. Wilkinson will read a paper "On the Difference between Collodion and Carbon Transparencies."

ENAMELLING PRINTS.—A correspondent of the *English Mechanic* says:—"I have given much pains to enamelling photos, and tried almost every published formula, with more or less doubtful results. I am now able, from experience, to give instructions by which an absolutely perfect surface may be easily obtained, either on mounted or unmounted prints. Nelson's photographic gelatine (Nos. 1 and 2) ½ ounce each, water 13 ounces, methylated spirit 1 ounce, to keep it. Collodionize the plate as usual. When dry, dip the trimmed print in the fluid gelatine, not too warm, and lay it flat on the plate; a superfluity of gelatine does no harm. The mounts should have been previously damped by dipping them in water and pressing them in a towel. Whilst the print is lying on the plate, take a damp mount and place *in situ* on the back of it; then with a squeegee give three or four sharp rubs to and fro, so as to drive out the bubbles and reduce the inclosed layer of gelatine to the utmost thinness. In four or five hours the mounted print will leave the glass perfect. N.B.—If the mounts are made too wet a separation from the print may occur when dry. If this happens just float the inside of the mount on the gelatine before applying it. Enamelled prints always look best made convex. For this purpose use a thin two or three-sheet board instead of the proper mount; when dry, trim and raise in the press. Cut a thin spring of card to place in the cavity behind the convexity, and prevent its collapsing. Mount by running a thin line of glue round the inner edge with a camel-hair pencil, and place under suitable pressure for ten minutes. If this is neatly done they ought not to show the faintest scratch when mounted."

REMOVAL OF STAINS WITH MAGNESIA.—Carbonate of magnesia—magnesia that has been previously calcined is best—is dried in an oven and mixed with sufficient benzine to form a soft friable mass. In this state it is put into a wide-mouthed glass bottle, well stoppered, and kept for use. It is spread pretty thickly over the stains, and rubbed well to and fro with the tip of the finger. The small rolls of earthy matter so formed are brushed off, and more magnesia is laid on and left until the benzine has evaporated entirely. Materials that will bear washing are then cleaned with water: on silks, alcohol or benzine should be used instead. The process may be applied to textile fabrics of every description, except those containing very much wool, to which the magnesia adheres very tenaciously. It may also be used for stains, old or new, on all sorts of woods, ivory, parchment, &c., without risk of injury. Ordinary writing ink is not affected by it, but letterpress ink quickly dissolves, owing to the absorption of the fatty matter in the ink.—*Scientific American.*

To Correspondents.

ONE WHO TRIES.—The position for the stop in a portrait lens as proportional to the foci of the front and back lenses, which we recently described to you, is the best for correcting distortion, and indeed for attaining the maximum average of advantages. An optician may, however, select another position to gain some specific advantage, or cure some specific defect in a certain lens; or it may, if a common lens, have had the slot made at random.

C. A. M. W.—We do not know of any rule. We should think it could only be ascertained by experiment.

R. M. L.—In the position you describe, a lean-to glass-room will answer best, and the proportions you mention will give good results. If the sitter be placed slightly fronting to the light, you will get good results.

G. R. FLUDDER.—We should have had no hesitation in recommending number one in your list but for one consideration. If your camera only expand nine inches, it is somewhat dangerous to have a lens of eight and a half equivalent focus, this being, of course, solar focus, and if you wish at any time to work at close quarters, the focus being extended a little might cause you difficulty. For your size of plate it is probable the six-inch focus might answer. Consult the maker as to which will be best for your purpose, and which will suit your camera. It is a capital lens for the varied purposes you require.

NO NAME (Swindon).—With your side light east and west, you must inevitably be troubled with direct sunlight morning and evening; but we do not see how in your position you can mend matters much. In enlarging your studio, we should recommend making the necessary extension in each direction, height as well, and preserve the rectangular form. This is easier to manage, especially in the matter of curtains and blinds, than such a plan as that you contemplate. With about six feet opaque, sides and roof, at each end you may secure a convenient studio.

EXPERIMENTER.—The evidence on ebonite baths varies. We have used one without perceiving any evil results. On the other hand we have heard of cases where the silver solution standing in the ebonite bath, has been much contaminated. As sulphur is used in the preparation of ebonite, there is probably some risk. A wooden bath lined with india-rubber of the kind described in "Echoes of the Month" in the present number, and also in recent letters, will be found light and safe.

R. SMITH.—The chief fault in the lighting of your specimen of gentleman's portrait, arises from too much light immediately at the side of the sitter, too little in front, and no reflected light on the shadowed side. In the lady's portrait there is too much light altogether direct and reflected. In the portrait of Barnum you enclose, the light is not so directly at the side as in your portraits. It is a side-light well in advance of the sitter. You do not state the aspect of the studio. Either No. 1 or No. 3 is good, but we prefer No. 1. No. 2 will not do at all.

CYMRO.—The safe mode of preserving the surface of enamelled prints is to mount them before leaving the glass, as you have often seen described in articles on the subject. Failing this, the use of Marion's mounting material, or the use of india-rubber solution will prevent the loss of glossy surface. 2 Zinc dishes may be used for gelatinizing the dishes. 3. The addition of carbolic acid or salycic acid will check decomposition in the gelatine solution.

P. W. (Horsham).—Thanks. The blending of the halves of two distinct stereoscopic subjects is very curious; but it is very perfect in this case.

J. L. F.—The retouching of your negative is done with care and delicacy; but it is carried to excess, and so destroys the texture of flesh, and also the minute modelling of the muscles of the face, upon which much of character and real likeness depend. The rule in retouching should be to do as little as possible, not as much as possible. Freckles, blotches, or other incidental defects may be removed or ameliorated, and at times, where very desirable, a light may be strengthened, or the feeble detail in shadows a little helped; but beware of absolutely putting in light or detail not indicated in the negative. This, unless done with consummate skill, by a perfect draughtsman and judicious artist, almost inevitably spoils the work, rendering it artificial looking and untrue. We prefer the warm tone; the other is somewhat cold and inky.

J.—Your old dark coloured collodion may be useful for adding in small proportions to new samples and giving the effect of ripeness. It may also be used for cleaning plates, at some risk to the comfort of the eyes, however; but you cannot with advantage attempt to restore its sensitiveness.

TROUBLED.—You are using a small quantity of printing bath, which of course rapidly gets weak. The mottled poor print indicates that the paper was excited on a small quantity of weak silver solution. The remedy is obvious.

JUPITER sends a long criticism of the late meeting of the Photographic Society, pointing out various irregularities in the mode of conducting it, from the point where one of the officers seconded the adoption of their own report, to the time when a member of the council so far forgot himself as to interrupt a speaker, and request that he should be put down because his comments on the report were not pleasant. We cannot print JUPITER's letter for several reasons, the first of which is sufficient. Its criticism, which is severe and somewhat personal, is anonymous, and therefore unfair. Besides, little purpose could now be served by such a letter; and the demands upon our pages for important subjects leave us no space for doubtful matter.

Several Correspondents in our next.

The Photographic News, March 10, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

More Photographic Societies and Journals—Berlin and Barbarism—A Means of Preventing Breakage—Prizes for Photographic Research.

More Photographic Societies and Journals.—It is encouraging to see that the interest felt for the progress of photography has given rise recently to several new photographic societies and journals devoted to photographic literature. Since the first of last month Switzerland, which possesses many worthy photographers, headed by the distinguished amateurs M. A. de Constant-Delessert, of Lausanne, and the Count de Courten, of Sion, has a photographic journal, which is published in the German language, under the title of "Schweizerische Photographen Zeitung." This journal appears at Mänedorff, on the lake of Zurich, its publisher being T. Richard, jun., and it appears once a fortnight. As there is no photographic society in Switzerland, notwithstanding the circumstance that both Zurich and Geneva possess many photographers of note, we presume the journal will be of an independent character, and not the organ of any particular society or body. At Toulouse, a new journal has likewise sprung into being, called the "Bulletin de la Société Photographique de Toulouse," this paper being the organ of the newly formed society at Toulouse, of which Colonel Paris is president, and M. Charles Fabre secretary. In Frankfort, as we have already mentioned, a new photographic society has just been formed, having for its name "Verein zur Pflege der Photographie und Verwandten Künste." Of this, the Frankfort Court photographer, O. Van Bosch, is the president, and the secretary M. Th. Haake. This society has no journal of its own, the proceedings being published, both in North and South Germany, by the *Mittheilungen* and the *Correspondenz.* A third new society connected with photography has made its appearance at Brussels under the name of "Mutuelle Photographie Belge," which is a benevolent society more than anything else, corresponding to similar bodies in London and Paris. A sick fund is established in connection with this society, as also a pension fund for members past work, while there is attached to it, as is the case with the London Photographers' Benevolent Society, a register, in which a record is kept of those who are seeking employers or employés. Of this Brussels Society, M. Delabarre is president, and Dr. D. Van Monckhoven and J. Dupont vice-presidents. The return of M. Hermann Krone to Dresden, after his tedious journey of upwards of twelve months to the Auckland Islands to photograph the transit of Venus, will probably be the means of reviving the Dresden Photographic Society, and its organ, *Helios*, of which he was respectively president and editor. M. Léon Vidal's removal from Marseilles to Paris, where he is now residing, superintending his Heliochromic process, has evidently given a death-blow to the Marseilles Society, of which he was the indefatigable secretary.

Berlin and Barbarism.—The Berliners, it seems, have been making merry over Mr. Sawyer's paper which recently appeared in these columns, entitled "Photography in Berlin." A translation of the paper was read at the Berlin Society for the Advancement of Photography, and the members assembled, we are told, were much tickled with the sentence, "Berlin is a city in which, as it always appears to me, civilization and barbarism jostle each other." It was hardly to be expected that such a view would pass unchallenged in an assembly of gentlemen who are quite as proud of their capital as Parisians are of theirs, and, unlike Londoners, do not quit its limits to reside in a suburb or locality some miles removed from the centre of the metropolis. The Editor of the *Mittheilungen*, Professor Vogel, who may be regarded as a cosmopolite, so widely has he travelled, could not forbear adding a protest on his own account to the statement, which he was sure Mr. Sawyer had not meant unkindly. He (the Editor) had met on his travels Englishmen who believed Berlin to be as cold as St. Petersburg, and that bears were to be found in the neighbouring forests. He had often been told by Englishmen, "Your standing army is a barbarism," and to this he had not hesitated to reply, "And so is your gigantic navy." We can well understand that the residents of "Unter den Linden" and the "Thiergarten" would be a little put out at the suggestion of barbarism being in their midst, since the power to see ourselves as others see us is not possessed by German human nature in any greater degree than by mankind generally.

A Means of Preventing Breakage.—A rather ingenious idea appears in one of our German contemporaries, which, no doubt, is found to answer its object very well. It is a plan for preventing the dipping-bath from being broken, which is a very vexatious thing, indeed, when it does occur, and in the case of travelling apparatus the circumstance is unfortunately rather rife. To reduce the occurrence to one of greater rarity, it is recommended that a buffer of paraffin be put between the bath and the case, which has the effect of protecting the thinnest utensil. Solid paraffin is melted and poured in the wooden case; then the glass bath itself is carefully and gradually heated by means of hot water, or otherwise, and pressed down into the molten paraffin, gently. In this way the bath is made to fit with solidity in its wooden case, and will withstand the strongest pressure that is put upon it with the screw-top.

Prizes for Photographic Research.—There are several prizes to be obtained by photographic experimenters during the next year, exclusive of the long list of medals which the Vienna Society promises. Indeed, it would seem as if people believed photographers were different to other people, and absolutely required some sort of pecuniary stimulant in order to make them improve the art by which they live. Judging from such money prizes as have been offered, and the awards made, we scarcely think that any good has resulted from such a course, for it must be exceedingly difficult for the jurors to make a selection of any improvement, and to say how far it is the work of the candidate before them. Again, it is, and ever will be, the case that England will be prejudiced in favour of English work, France for French, Germany for German, and so forth; hence, it is seldom that an award is made that is generally satisfactory. We will enumerate the different prizes offered for photographic research at the present moment. The French Photographic Society offers 500 francs, and the French Government a similar amount—making a total of 1,000 francs, therefore—for an improved dry-plate process. Another prize of 500 francs will be given by M. Liebert, a member of the French Photographic Society, for a method of shortening exposures in the studio. A similar sum, or gold medal of like value, is offered by an anonymous gentleman, through the medium of the Belgian Photographic Association, for the quickest dry-plate process. The Toulouse Photographic Society, as we have already stated in these columns, offers prizes for an improved lens and apparatus. Finally, the Rouen Industrial Society offers a gold medal for the application of photo-engraving to calico-printing and similar purposes.

FOREIGN NOTES.

Dr. Henri Napias, whose sanitary hints on photographic matters are as familiar to photographers in this country as in France, is about to publish further notes on the subject in the form of a pamphlet. Its title will be *Hygiene des Photographes*, and it will contain the experience of Dr. Napias during the several years that he has made the diseases and ailments of photographers his especial study.

Photographers have so many things to deal with that are noxious to health, that any means taken to make them better informed with their sanitary condition, and to protect them in their work, will be eagerly received.

A firm of porcelain manufacturers at Gijon, in France, has been turning its attention to the ornamentation of vases and such like articles with photographic pictures. The images are either burnt in upon the porcelain, or applied simply by transfer, in which case simple carbon photographs are employed. In the latter case, after the pictures have been firmly attached to the porcelain, they are covered with a hard varnish, which protects them most perfectly from exterior influences, the vessels being capable of being washed without injury. The demand for such works of art is said to be very large; last year four hundred objects of this newly projected industry were supplied to customers, and this year the demands are threefold. The vases are usually ornamented with portraits of one kind or another. The firm propose to exhibit their wares at the next photographic exhibition held in Paris.

This exhibition, as our readers have already been informed, opens to the public on the 1st May, being comprised in the same building—the *Palais de l'Industrie*—as the *Salon*, or French Royal Academy, which opens at the same time. The Paris Photographic Exhibition enjoys, therefore, considerable éclat. Pictures have to be sent in by the beginning of April at the latest, and applications for space must be made forthwith to the Secretary of the French Photographic Society, Rue Louis le Grand, No. 20, Paris.

Prince Lobkowitz has been distinguishing himself as an amateur photographer. He has produced, it is said, some of the finest landscapes of Bohemian scenery and architecture during the ten years that he has devoted himself to the art, and he is now about to attempt the depiction of all the castles and burgs of Bohemia, a collection of pictures which will in the end form a very fine series, of interest quite as much from a historical as pictorial point of view.

From what has transpired of the photochromic processes of M. Leon Vidal, by which, we are told, thousands of prints are daily produced at a special *atelier* fitted up in Paris, it seems to be a fatty-ink method similar to Lichtdruck, Heliotype, &c., several printings being made use of, as in producing chromo-lithographs.

The paper manufacturers of Germany have been making some alterations in the size of their sheets, and the numbers that go to the German quire, ream, &c. It is questionable, however, whether the change will affect the sale of albumenized paper.

Dr. Hornig has again been elected president of the Vienna Photographic Society, and Fritz Luckardt, the well-known Viennese portraitist, again assumes the functions of secretary.

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SPLITTING OF THE FILM.

BY LEOPOLD BACHRICH.*

AT a recent meeting of the Vienna Photographic Society, the question of the splitting of the collodion film was discussed, and information was asked for, both as to the reason of the appearance of this phenomenon, as also the remedy to be employed to overcome the evil.

If the remarks made by others on the subject had been in accordance with my own views, I should not have troubled the readers of this journal with a communication, especially as they may feel more interested in such matters as carbon printing than in an old one like the present. As it is one, however, of some interest, I propose to allude to a few points that are scarcely generally known, but which I have been acquainted with for many years, in regard to the varnishing of my negatives, and have thus been enabled to preserve the latter from injury for a series of many years.

In order to make myself perfectly understood, I must preface my remarks with the statement that we have to deal with two different kinds of phenomena: hair lines, where the film has separated without lifting from the glass; and broad worm-like markings, which zigzag over the negative in relief, and which we would gladly press down again to restore our cliché.

It is no doubt correctly assumed that cold and moisture are the causes of these evils, and to avoid them photographers are recommended to envelop their films in a sheet of filter paper. We think, however, it is better still to render the negative itself proof against the defect, and how this can be done I will endeavour to show.

It has sometimes happened, and more particularly in the case of glass plates frequently employed, that the collodion film no sooner dries than it begins to separate from the glass, and the consequence is a perfect destruction of the image. I found in cases of this kind that if, while still moist, a little gum water is poured over the film, the latter is saved, and does not lift from the plate.

Since that time I have never given up employing a solution of gum by way of a preservative, and to this circumstance I attribute on the one hand that my negatives do not suffer in any way from damp or cold, and also the fact that when the negative is varnished, I need not allow it to dry spontaneously, but am able to hold it over a spirit-flame, moving it about the while until the film has completely dried. A plate treated in this manner contains, as one can easily understand, much less moisture than one dried in the atmosphere, and of which the surface only is touched by the spirit in the varnish, while in the inside there is still moisture. The gummed negative is harder and more brittle, and less likely to absorb moisture from the atmosphere, and thus fall a prey to splitting of the film. As a matter of precaution, I always envelop negatives not in use in filter paper, to preserve them as much as possible from mechanical injury.

It is sometimes remarked that while old negatives have their films undamaged, newer ones introduced into the frames suffer considerably. This fully bears out my argument that well-dried films are not influenced so much by moisture and cold, and are more capable of withstanding the same, than less perfectly dried films, and therefore I think the warming of the negative over a spirit-lamp or stove cannot be too strongly recommended.

The first-named thin or linear, hair-like fissures may be overcome by rubbing with the finger, but before doing so it is well to breathe well upon the film first of all, so as to render it more elastic and capable of joining together easily. On the other hand, plates which present the other kind of worm-like fissures, if not altogether capable of restoration, can at any rate be made serviceable again by being varnished once more with a thin varnish, and then pressed in the printing frame when the film has dried.

Finally, I may remark, in reference to the statement that has been made that large plates are more apt to suffer in this way than smaller ones, that the reason for this is simply to be found in the circumstance that a thicker film collodion is at hand, and this it is that is the cause of such defects.

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EXPERIENCES IN WORKING GELATINO-BROMIDE EMULSION.

BY REV. H. G. PALMER, M.A.*

I HAVE been requested to supplement the remarks upon the gelatine process, which I was privileged to make at the January meeting of your society, by a paper upon the same subject, supplying the results of my experience with greater detail than I was able to afford in the cursory résumé I then endeavoured to give.

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* *Photographische Correspondenz.*

* Read before the Edinburgh Photographic Society.

I comply with the request with much pleasure, in the hope that the following details may be of some use to those who are anxious to give gelatine a fair trial, and that they may thus be speedily convinced of the many advantages it possesses over all other processes, whether wet or dry.

Among these advantages I may mention the following. It alone will give absolute instantaneity—in a good light; it is simpler and more certain in its mode of working than other processes; the largest plates may be coated with it, with absolute certainty of success, and at the cost of a mere trifle; the fumes of ether, so noxious to some invalids, are abolished; the cumbersome paraphernalia of the wet process are superseded; portraits and interiors may be taken at any distance from home; and last, and not least, it is the most inexpensive process a photographer can adopt.

I propose to notice, first, the main causes of failure with gelatine, and these, I think, may be resolved into three:—

1. The character of the light in the working-room.
2. Want of patience in preparing the emulsion.
3. The length of time allowed for the plate to dry spontaneously.

As to No. 1 of these causes, I may remark that it is a mistake to imagine, as some do, that gelatine emulsion and plates can only be prepared in the gloomiest of lights, and therefore in the greatest discomfort. It is not the quantity of light in the laboratory which is so often the cause of fog, so much as its character. The first thing, then, is to ascertain the amount and quality of light by which this process can be worked without risk. I have made many experiments with different kinds of ruby and professedly non-actinic glass, and find in practice that Forrest's non-actinic orange, plus one thickness of orange tissue paper, gives absolute freedom from fog, even with bright sunlight passing through it. Accordingly, in my work room, I have a wooden lantern standing in the centre of the top of my drying cupboard, by the light of which I work with the greatest ease and safety. The accompanping drawing of it will explain itself (No. 1). The lamp burns paraffine and gives a very bright light, and I wrap around the glass one thickness orange tissue. In the grooves A, A, A, are three sheets of Forrest's non-actinic orange glass (each pane being 18 inches by 12 inches), and at the top and bottom of the back there are apertures to give ingress and egress to the air.

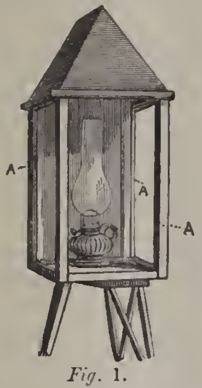

Fig. 1.

The next cause of failure on my list arises mainly from over haste in passing the emulsion through the fine linen filter. The gelatine receives a preliminary soaking of half an hour; it is then placed in a hot bath, frequent shaking being administered to effect the solution of the pellicle; it is next passed through fine linen to remove bubbles, &c. But very often the last operation is performed too soon, and, on examination, the linen is found to contain a portion of the pellicle undissolved. The result of this will naturally be, a batch of plates which will afford the thinnest of negatives, and which will obstinately decline intensification of any sort or kind. To avoid this, the emulsion should be mixed, and solution of the pellicle obtained by frequent stirrings with a glass rod (the bottle containing the gelatine being in a hot bath the while); and on no account should the emulsion be passed through the filter so long as any soft substance can be detected with the rod at the bottom of the bottle. The result of too long protraction of the process of drying is not evidenced until the time comes to develop a picture, and then it will make itself manifest in blisters in the centre and in frillings at the margin of the plate. In damp weather it is sometimes well nigh impossible to get the plates to dry spontaneously; and it is no easy matter to raise the temperature of the room to just the proper height to secure speedy drying. The small apparatus (for the idea of which I am indebted to Mr. Kennett) depicted in plate 2 answers admirably for this purpose, A is an iron cone, firmly fastened to a circular base of the same metal; B is the inlet for air, with movable cover; C, to regulate the supply; D is the outlet, and this is fixed in an aperture at the bottom of the drying cupboard; the lamp underneath is called the Rechaud spirit-lamp. Drawing No. 3 will explain the cupboard and its appliances; mine contains four shelves accurately levelled, and sufficiently capacious to hold eight dozen quarter plates, or two dozen 9 by 7. The top is my operating table, and in front are light-tight doors, with lock and key to baffle inquisitive visitors to the dark room. After coating a batch of plates, they are placed in succession upon the shelves, the doors are closed, the lamp lighted, the supply of hot air regulated at pleasure, and in a few hours the whole batch will be ready for use.

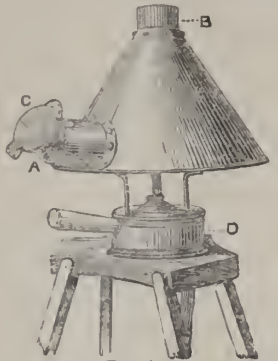

Fig. 2.

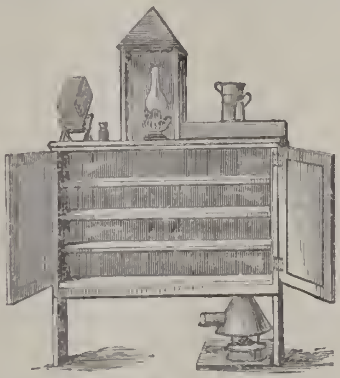

Fig. 3.

The arrows indicate the course of hot air through the drying closet.

Without doubt, the simplest and safest plan is to prepare the emulsion with Kennett's pellicle. This is done as follows:—Two ounces of distilled water are poured upon eighty grains of pellicle in a four-ounce wide-mouthed bottle; in about half an hour the bottle is placed in a vessel of hot water, and then roughly stirred until the gelatine is entirely dissolved. If, however, it is desired to make the emulsion *ab initio*, the following formula will be found to answer well:—

Nelson's gelatine	40 grains
Distilled water	14 drachms
Alcohol...	2 ,,
Bromide of potassium	25 grains
Nitrate of silver	40 ,,
20-grain per oz. solution of bromide of ammonium	2 drops.

Let the gelatine be soaked for five or six hours in water, and be then drained. The bromide is next dissolved in seven drachms of water, and poured upon the gelatine. The latter is now treated to a hot bath, and stirred with a glass rod until complete solution has taken place. The silver is then dissolved in seven drachms of water, and is poured little by little into the gelatine, the whole being frequently shaken. After this, two drachms of alcohol and two drops of bromide of ammonia are added; emulsion is poured into a flat dish until it has set; it is then cut into strips with a slip of glass, placed in a sieve with fine linen stretched over the bottom, suspended under a tap to which a rose has been fastened, and thoroughly washed for six hours at least. After draining, it is treated to a hot-water bath until completely liquefied, and then distilled water is added to bring up the amount to two ounces.

I will now give the details of the preparation of gelatine dry plates in proper sequence. On the top of the drying cupboard are the following articles:—The wooden lantern is in the centre, and to the right of it a flat hot-water tin, covered with a sheet or two of blotting-paper. This is used to give warmth to plates, if I am coating those of large size. Small plates do not require to be warmed. On the right side also I have an infant's food-warmer with the burner alight, a little hot water in the tin boiler, and the porcelain cup clean, empty, and ready to receive the emulsion. I need hardly say that the light emitted by the burner must be carefully screened off with brown paper. On the left are the clean plates, a brush for sweeping each plate before coating, a pneumatic plate holder, and a glass rod in a vessel of warm water (for large plates only). It is unnecessary to urge the importance of clean plates, but I may notice here an advantage over this process over every other with which I am acquainted, viz., that old gelatine plates need to be merely placed under a tap of hot water until the film is dissolved; then thoroughly rinsed and polished with cloth and leather without further trouble. The emulsion must be filtered through fine linen into the porcelain cup of the food-warmer, and the filter bag should rest against the side of the vessel to prevent bubbles in the filtered emulsion. If the plates are of small size, it will be found that the gelatine flows after a little practice as easily as collodion without the assistance of a glass rod. Large plates, however, must be warmed (or the gelatine will chill and thicken), and can then be coated with the greatest ease as follows: A pool is poured from the lip of the cup along the right-hand margin of the plate from corner to corner. The emulsion is then swept before the glass rod to the other end, without endeavouring in the least to secure evenness of film. This is effected by now flowing over a fresh supply of emulsion, and the surplus is disposed of by allowing a corner of the plate to touch the side of the cup. The two things to be avoided in the process of coating are, bubbles on the film or in the emulsion, and over-draining of the plate, and consequent thinness and weakness of the negative.

The whole process, whether with small or large plates, is done with the greatest ease and rapidity, the chief desideratum for comfortable working being a pneumatic holder, which may be relied upon to cling fast to its plate. As soon as the coating is effected, the plates are put one by one upon the level shelf below, until all are finished; the doors of the drying cupboard are closed; the lamp below is lighted; and a stream of hot air is sent over the film until they are dry.

As regards exposure, it should be borne in mind that Kennett's rapid pellicle and plates are, with good light, really instantaneous. Nothing can surpass the cloud, wave, and street views taken with this preparation; and for baby portraits it is simply perfection itself. The ordinary pellicle is much slower, and admits of considerable latitude of exposure. On a bright January day I exposed six plates experimentally upon a well-lighted subject, giving (1) 10, (2) 20, (3) 30, (4) 40, (5) 60, and (6) 120 seconds respectively. I developed with a three-grain solution of pyro, using at first one drop of a one-in-sixteen solution of strong ammonia to two drachms of developer. All came up to printing density without any intensification. No. 1 was wanting in detail; 2, 4, and 5, were fair negatives; 3 (30 seconds), perfection; 6 spoilt from over-exposure. The lens used was Dallmeyer's medium angle rectilinear for quarter-plates, and the stop was the smallest of the five. These ordinary pellicle plates, then, require rather more than half the exposure requisite for a wet plate. I do not recommend any one to deviate from the directions as to developers and the methods of using them supplied by Mr. Kennett. In my own practice, however, I prefer, after washing a plate well till the water flows everywhere upon the film, to soak it for a time in three-grain pyro, and to bring out the picture with one drop of ammonia to a quarter-ounce of developer, gradually and cautiously adding the alcohol till printing density has been obtained. If intensification is necessary, no process can compare for safety and certainty with the chloride of copper. The negative is placed in a solution of chloride of copper (the strength seems to matter very little) until the image has disappeared, and then, after abundant washing, a strong alkaline developer brings up the picture to any amount of intensity. I use one drachm of a one-in-sixteen solution of strong ammonia to one ounce of three-grain pyro.

The golden rule to be adopted throughout the development of these plates is: "Give them abundance of water." Nearly all the ills that gelatine films are heir to after exposure are due to insufficient washing. I have found no advantage from backing gelatine plates, save in the case of negatives of interiors. In these it is absolutely necessary to use it if it is desirable to avoid blurring round windows, &c. And now I draw my lucubrations to their conclusion, in the hope that in addition to the fatigue and possible impatience which, I fear, I must have occasioned to those who have been good enough to listen to this paper, I may have stimulated some one to put away his collodion and troublesome bath, and try gelatine.

Since the above paper was written, the discovery has been made that greater brilliancy and beauty may be obtained from gelatine negatives by substituting mild ale for the water in preparing the emulsion.

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ON THE CHEMICAL ACTION OF LIGHT UPON PURE AND COLOURED BROMIDE OF SILVER.

(*Communicated from the Photographic Laboratory of the Royal Industrial College of Berlin.*)

BY PROFESSOR H. VOGEL.*

THE following is a short summary of the results obtained during the past three months in my investigation of the above subject.

1. Pure bromide of silver shows, by sufficiently long exposure to a spectrum of the requisite intensity, sensitiveness right into the ultra-red. I have obtained plates in which the line A is plainly photographed, and besides this a portion of the ultra-red, equal to the distance of the lines BA. These same plates show a picture of the whole visible spectrum. Chloride of silver is also sensitive as far as line A, and dry bromide of silver farther still.

2. To the already mentioned colouring substances which enhance the sensitiveness of bromide of silver for that por-

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* *Photographische Mittheilungen.*

tion of the spectrum that they absorb, may be added methyl-violet, which I obtained from Herr Chojnacki, and cyanin from Herr Hofmann. The latter increases the sensitiveness of bromide of silver for orange in an extraordinary degree. On the other hand, picric acid, aniline blue, night blue, pencéelac, indigotine, and purpurine had no such favourable influence. A partial explanation of this abnormal behaviour I have already offered to my readers, and it is a subject that I shall come back to.

3. The colouring of the bromide of silver film, which, in the first instance, I invariably brought about by the admixture of some pigment to the collodion, may be produced in a simpler manner by pouring over the finished plate an alcoholic colour solution, and allowing the same to dry. In this manner pigments may be used which might have an injurious effect upon the collodion or silver bath, and cyanin is one of these.

4. A too darkly tinted film, as I formerly pointed out, is disadvantageous, as the colouring matter upon the film itself weakens the light a good deal before it can impinge the sensitive bromide of silver molecules. I had, therefore, to make several experiments before I could hit upon the right intensity. The difficulty may be overcome very easily, if the coloured bromide of silver plates are exposed to the action of the spectrum from the back, so that the rays passing through the glass at once strike the bromide molecules. In this way it is possible to test opaque or nearly opaque films.

The low position of the sun renders it impossible for me to continue my experiments at this period of the year, even in fine weather. It is very gratifying to me, therefore, that Captain Waterhouse, of Calcutta, who works under a more favourable sun, and with a large assortment of colouring matters from the tropics at hand, has taken these experiments in hand, his efforts having already led to some valuable results.

HOW TO PRODUCE PELLICLE CLICHES, AND TO OBTAIN A PORTRAIT AND FRAME-WORK AT ONE PRINTING.

BY C. QUESNAY.*

Two clichés are necessary to obtain prints of this kind, one upon pellicle, the other upon glass, and it is by the superposition of the two clichés that the portrait and framework are obtained together.

First Cliche.—Take an ordinary glass plate, rub it well, and apply a solution of—

Ether at 65°	500 cub. cents.
Virgin wax	·05 ,, ,,

The solution should be filtered, before application, through a tuft of cotton-wool. Evaporation takes place very rapidly, but in winter time a little warmth is desirable. The surface having dried, it is rubbed gently by means of a dry tuft of cotton-wool, moisture having the effect of removing the film of wax altogether. The plate is in this manner rendered transparent, and several may be prepared in like manner ready for use.

The plates are next coated with collodion, and sensitized ready for use. Before producing your negative, however, you trace upon the ground glass of the camera, and focus carefully, so that the portrait falls in the middle of this oval. Between the partition of your dark slide and the sensitized plate, you next place an oval cut very cleanly, which corresponds precisely to that upon the ground glass. In this way you obtain the ground around the portrait of a transparent nature, which is indispensable in the production of such photographs as I am describing.

The portrait taken and the cliché produced, it is not varnished, but put upon a levelling stand, and there is poured over it a fifteen per cent. solution of gelatine, care being taken to prevent air-bubbles. The film, about a millimetre in thickness, is allowed to set, and it is dried in a position sheltered from the dust. When perfectly dry, a little mattolein is rubbed over it, to facilitate any retouching that may be necessary.

Afterwards some normal collodion is poured on, made up of—

Ether at 65°	50 cub. cents.
Alcohol	60 ,, ,,
Pyroxyline	2 grammes
Castor oil	2 to 3 drops

It is always necessary that the alcohol should be in excess, so that the film of wax is not dissolved away by the collodion.

Four strips of paper are attached, preserving the margin so that your portrait may be easily shaped, and when the whole is dry, four cuts with a penknife suffice to detach it from the glass.

Second Cliche.—Put upon the object which you desire shall form the framework of your portrait a black oval block of the size of the portrait upon the first cliché. Then take a negative in the ordinary way, which will have its centre transparent. This cliche is varnished and placed upon the pellicle negative, attaching the latter by means of a little gum, and then you print as if you had to do with a single cliche only.

If you wish to give your portrait two separate tints, you must proceed as follows.

Wash your prints well as soon as they come out of the printing frame, to remove every superfluous trace of nitrate of silver, and then place the pictures in sheets of filter paper specially employed for the purpose. Dip a brush into a solution of hyposulphite of soda (20 per cent. strength), and draw it over the portrait, following the outlines thereof. Every part of the portrait being thus treated, wash thoroughly in water, and then tone. You will in this way have secured two tints: the framework of a sepia tone, and the portrait of a violet colour.

There is a second method, which consists in taking the portrait without an oval, either in the dark slide or camera. Your negative is made as shown in the case of the first cliché, and upon this is put a sheet of paper, the object of which is to prevent fraying, and then the pellicle is removed upon a sheet of mica, attached by means of gum. The same thing is done in the case of the frame; and you then possess two ovals, one a block, and the other an open one.

The means I have described of securing two tints was indicated by M. Harltier in 1865. With a double cliché it is very easy thus to obtain portraits in carbon without transferring, or, in other words, the paper which receives the carbon tissue serves as a definite support, and the print is found to be in its true position, because you have printed through the pellicle cliché.

I think that the method I have indicated will be of the greatest assistance to photographers printing cartes de visite in carbon, for it is very difficult, even with the aid of guiding points, to make the portrait coincide with its framework. There is nearly always a line of demarcation to be seen, but when one has to do with a double cliché this never happens. If either the framework or portrait prints too fast, the one or the other is covered with a piece of transparent paper.

Strength of Materials.—The following will give a good idea of the relative strength of various substances. Made from the best steel, a rod ¼ inch in diameter will sustain before breaking 9,000 lbs.; soft steel, 7,000 lbs.; iron wire, 6,000 lbs.; good iron, 4,000 lbs.; inferior bar iron, 2,000 lbs.; cast iron, 1,000 to 3,000 lbs.; copper wire, 3,000 lbs.; silver, 2,000 lbs.; gold, 2,500 lbs.; tin, 300 lbs.; cast zinc, 160 lbs.; cast lead, 50 lbs.; milled lead, 200 lbs.; box or locust wood, 1,200 lbs.; toughest ash, 1,000 lbs.; elm, 800 lbs.; beech, cedar, white oak, pitch pine, 600 lbs.; chestnut and maple, 650 lbs.; poplar, 400 lbs.

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The Photographic News.

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PHOTOGRAPHIC APPLICATION OF THE RADIOMETER.

In the interesting letter of "R. H. P." in our last, attention is called to the possible photographic use of Mr. Crookes' recent discovery of the mechanical action of light. On the first announcement of this discovery, and the early illustration of the phenomena by means of the radiometer, every one was struck with the novelty—or shall we say freshness or unexpectedness?—of the discovery, and the elegance of the ingenious little instrument by which its nature was shown; but few persons would have been disposed to predicate any practical application of an instrument so delicate or a power so subtle. The birth of a discovery and its application lie far apart. Many winters and many summers often elapse between the seed-time and the harvest. "Knowledge," says the writer of a recent scientific report, "goes before the application of knowledge, and the application of a discovery is seldom foreseen when the discovery is made. The first origin of a great discovery is often, like the germ of the natural life in an animal or a vegetable, so small as to be scarcely perceptible, and yet it may contain in it the seeds of the grandest results." In the case of Mr. Crookes' discovery, however, we have an important possible photographic application at once indicated. Having devoted so much of the earlier years of his scientific life to the study of photography, the possibilities of his recent discovery in relation to photography were scarcely likely to be overlooked.

We have just been favoured by Mr. Crookes with a pamphlet containing an article he contributed to the *Quarterly Journal of Science* for July last, in which he has anticipated the suggestion of "R. H. P.," and pointed out the application of the radiometer for the general purposes of photometry, and its special use in connection with the studio and dark room. Speaking of its general use as a photometer, he says:—

"By timing the revolutions of the instrument when exposed direct to a source of light—a candle, for instance—the total radiation is measured. If a screen of alum is now interposed, the influence of heat is almost entirely cut off, the velocity becomes proportionately less, and the instrument becomes a photometer. By its means photometry becomes much simplified; flames the most diverse may readily be compared between themselves or with other sources of light; a 'standard candle' can now be defined as one which at x inches off causes the radiometer to perform y revolutions per minute, the values of x and y having previously been determined by comparison with some ascertained standard; and the statement that a gas-light is equal to so many candles may, with more accuracy, be replaced by saying that it produces so many revolutions."

The first photographic application Mr. Crookes suggests for the radiometer is very ingenious. It affords a simple method of testing the efficiency of the yellow or orange glass in the dark room window. Mr. Crookes says:—

"To photographers the radiometer will be invaluable. As it will revolve behind the orange-coloured glass used for admitting light into the so-called dark room, it is only necessary to place one of these instruments in the window to enable the operator to see whether the light entering his room is likely to injure the sensitive surfaces there exposed; thus, having ascertained by experience that his plates are fogged, or his paper injured, when the revolutions exceed, say, ten a minute, he will take care to draw down an extra blind when the revolutions approach that number."

In the case of extra sensitive films like those of Kennett's gelatine pellicle, such an aid to the estimation of the amount of light in the dark room will often be found of service; but its value in estimating camera exposures is more important still, and here in many cases it may become invaluable. Mr. Crookes on this subject says:—

"Still more useful will the radiometer be in the photographic gallery. Placing an instrument near the sitter at the commencement of the day's operations, it is found that, to obtain a good negative, the lens must be uncovered, not for a particular number of seconds, but during the time required for the radiometer to make, say, twenty revolutions. For the remainder of the day, therefore, assuming his chemicals not to vary, the operator need not trouble himself about the variation of light; all he has to do is to watch the radiometer and expose for twenty revolutions, and his negatives will be of the same quality,[*] although at one time it may have taken five minutes, and at another not ten seconds, to perform the allotted number."

An instrument capable of registering, with extreme delicacy, either intense or feeble action of light by such a definite measurement as the revolutions of the radiometer, seems to supply all that can be required in an actinometer for the studio; and it is probable that by a slight modification it may be made equally suitable for estimating exposures in carbon printing.

◆

BEER AS A VARNISH.—A MODIFIED BEER PROCESS.

Some years ago Mr. Blanchard, in a communication to our pages on the splitting of films whilst drying, mentioned that he had found stale beer applied to the wet plate after well draining, or when surface dry, effectually prevented the film from splitting up, and gave it a firm hard protective surface much better than gum water used in the same way, and less hygrometric, or apt to become sticky afterwards. A recent correspondent of the *Photographic Times* describes some experiments in which he has used beer in a similar manner, having first concentrated it to get a thicker coating. He says:—

"During a course of experiments on preservatives for dry plates I distilled two gallons of lager beer,[†] first removing all the spirit, or as much as can be obtained by distillation,[‡] and then concentrated the mucilaginous and saccharine residue to one pint. In this state of concentration the residue is very consistent and clammy, and resembles the sediment of molasses at the bottom of a barrel; it has a very bitter taste, and smells of malt, hops, and sugar. Although not relevant to the question before us, it may not be uninteresting to our readers to learn how much spirit was obtained from the two gallons of lager; the amount was equivalent to three ounces of absolute alcohol, or six ounces of proof spirit. No wonder that some of our friends can drink a couple of gallons without placing themselves in a tight corner!

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[*] In this brief sketch I omit reference to the occasions in which the ultra violet rays diminish in a greater proportion than the other rays.

[†] Lager beer is a favourite beverage in America. The term is German, and is equivalent to strong ale.—Ed. P. N.

[‡] It is not, probably, impossible to remove or separate every atom of alcohol from a mucilaginous or saccharine solution, or even from water itself, by distillation.

The amount of residue, I think, can have no intoxicating properties; it is possible, however, that it may produce a stupefying or a soporific effect, owing to the presence of the infusion of hops. Its general effect will be that of nutrifying or feeding the body, superior even to a pint of mush or a dish of porridge, because the substance being in the form of solution, it is better suited for assimilation. Hence the corpulence which the imbibition of malt beverages generally institutes and produces.

But now to the photographic value of this lager beer residue. I first took an ounce of the mucilage and diluted it with an equal quantity of water, and poured it upon a glass plate, and then let the plate drain. The film was then dried over the lamp; it became perfectly hard, and showed no tendency to chalkiness. By pursuing the experiments I found two coats of this varnish, applied consecutively after drying, form a hard, impervious film, free from all tendency to adhere to the paper under the pressure frame, and, in fine, equal to a film of the best varnish.

Next comes the practical application, and the economical feasibility must be investigated. Thus two gallons of lager will yield one quart of this varnish of a proper consistency for flowing over the plate; but the plate must be wet, otherwise the varnish will not flow easily. I therefore propose to pour the first coating over the negative as soon as it has received the final washing and is still quite moist. When this film is dry, the second coating is applied in sufficient quantity, and the film is dried before the stove or over the lamp until it is quite hard. When only about a dozen prints have to be taken from a negative, a single application of the varnish will be quite sufficient, and it is just for such purposes that the lager varnish is excellent and economical.

But this is not the only application of the lager varnish, or, at any rate, not its only quality; for, when applied exactly as above mentioned to a sensitized wet plate, after the latter has been carefully washed at the tap, in order to remove all the free nitrate of silver, it forms one of the best dry-plate preservatives; in fact, the lager beer dry plate is equal to the very best. The film of varnish for the dry plate, as well as for the wet plate, must be dried by artificial heat; and this being the case, and since the light of a lamp would be prejudicial to the sensitive film, it is necessary to be provided with some means of performing the operation in the dark. This can be accomplished by the heat of a stove, or by a drying chamber heated by steam.

The lager process is somewhat different from the malt process, from the fact that the infusion from lager contains not only all the amylaceous and saccharine substances of the latter, but, in addition, the soluble contents of the hop, such as tannin, gum, &c. These, from their astringent nature, bind together the film, and render it less hygroscopic, and consequently more permanent.

The lager plate has to be exposed, like any ordinary dry plate, much longer than a wet plate, even six or eight times as long. Since the preservative film is more consistent and harder than the generality of such coatings, it is necessary to place the exposed plate a few minutes in distilled water before the developer is poured upon the film. The picture comes out equally well with either acid pyrogallic or with an iron developer, containing in either case a drop or two of nitrate of silver.

* * *

PHOTOGRAPHY AND ARCHITECTURE.

Some interesting details are given in the *New York Times* of the extent and manner of applying photography in th office of the Supervising Architect in connection with the U.S. Government. When a building has been "located," and an appropriation made for its erection, we are told "the Supervising Architect makes a rough draught of a plan, which is subsequently worked up under his personal supervision by one of the corps of practical draughtsmen kept constantly employed in his office. About twenty-five experienced draughtsmen are thus employed. The working plan for a building being carefully finished, a tracing is made from it on tracing linen. This last is sent to the photographer, Mr. L. E. Walker, who has perfected a process of reproducing these plans by photography in a manner that is expeditious and economical to the Government. This is the use of paper in lieu of glass negatives. The substitution of paper for glass is not claimed by Mr. Walker as having originated with himself, but has been more extensively used by him than by any one else prior to his adopting the process. This he first did after the first battle of Bull Run, when a number of war maps were desired, which were to be prepared as quickly as possible. In photographing the plans for the architect's office, it is, of course, necessary that the copies of the working plans should be made as rapidly as possible, because such copies are sent to all who make proposals for contracts for the buildings. As it is essential to retain the negatives of these, it would require a large storeroom, as well as great expense in the first cost, if glass negatives were used. The mode of photographing is about as follows:—

"Sensitive paper is laid with its sensitive surface downward on the plan traced on the tracing-linen. These are then placed in a compress, with the sensitive paper uppermost and glass covering its outer surface. The whole is exposed with the glass uppermost to the direct rays of the sun. A platform which projects from the second storey of the building used by the photographer is used for this printing. A better place for the purpose could not well be devised, as the platform has the sunlight entirely unobstructed, the photographic establishment being situated in an exposed position in the grounds south of the Treasury building.

"The paper negative printed by the above method appears, of course, reversed, the ground being black and the lines white; and when in its turn it is applied in the manner above described to the surface of sensitive paper, an exact photograph of the original plan is obtained. Reductions in size cannot be made with paper negatives, as is practicable with a lens.

"Mr. Walker has been in charge of the photographic branch of the Supervising Architect's office since June, 1857, ably discharging the duties his position demands. Major A. H. Bowman was then 'Engineer in Charge' of the office now styled the 'Supervising Architect's' office, and Major Edward French was Assistant Engineer in charge of buildings constructed under the Treasury Department. Up to that time these offices had always been under the direction of officers of the Engineer Corps of the army. The photographic branch began its operations in a small room with one window on the courtyard side of the Treasury building. Later, Mr. Walker was assigned an apartment in the south wing of the Treasury. Later still he removed to a small frame building standing where the porter's lodge of the eastern gate of the Treasury now stands. Subsequently the picturesque cottage he now occupies was erected for his use. During the war Mr. Walker made photographs of the Engineer's maps.

"When Prof. H. Vogel, the photographer for the German Government at Berlin, visited Washington, he was greatly pleased with Mr. Walker's method of photographing above described. He paid Mr. Walker many compliments in conversation, and also wrote of his work in the most flattering manner in photographic journals. Since his return to Berlin Prof. Vogel has introduced the use of paper negatives in that city, and they are very generally used there at present."

PRACTICAL NOTES ON VARIOUS SUBJECTS.

BY CHARLES WALDACK.

Definition in Carbon Prints.

In a recent publication, Mr. Debenham suggests that the want of definition complained of during the hot weather may be caused by want of contact in the printing, owing to the dry and hard condition of the tissue. The Belgian photographers who have met with this trouble are too old hands at the business not to have taken care that the tissue was in contact in every part with the negative. In my own case I can assert that the matter was not overlooked. Further, Mr. Debenham is wrong in supposing that hot weather is necessarily dry weather. The hard and crisp condition of the tissue to which Mr. Debenham attributes our troubles is the rule when the thermometer is below the freezing point, and the exception during the hot season.

That the want of definition complained of is caused by the tissue, I have had ample evidence. In one of my communications to this paper I mentioned the special transparency as giving sharp prints in spite of the hot weather. Since, I have had occasion to use tissues on which the layer of gelatine was very thin, and these tissues gave much more definition than the ordinary tissues of the Autotype Company.

Some Autotype tissue manufactured about two years back gave sharper prints than another sample procured recently. In the first the gelatine is in a thin layer, and the relief small; in the latter, the gelatine is much thicker, and the relief in proportion. It would seem as if the thicker the gelatine the less the definition. The great trouble with these thin tissues is that they adhere with difficulty to rigid supports, but a substratum of collodion overcomes this trouble.

Single Transfers on Albumen Paper.

I would recommend to all those who begin the practice of the carbon process to use albumen paper for single transfers. The prints obtained in this way are of exquisite beauty if a good tissue is used, and on first inspection are not distinguished from silver prints. They take the same polish when passed through the burnisher except in the light parts, which remain more or less matt. The albumen should be first coagulated by means of strong alcohol. The sheets are put one on the top of the other in a tray containing alcohol, left for ten minutes, and then all taken out together and hung up to dry. The transfer is made in the ordinary way, and the development is conducted at a low temperature. The process is so easy, and the results obtained so fine, that it is worth while to go to the extra trouble of making reversed negatives, or removing the negative film from the glass.

Albumen Paper as a Permanent Support in the Double Transfer Process.

In the 11th of February number of the News I find an article by A. Wellesley Turner, in which he recommends the use of coagulated albumen paper in the double transfer process. The prints on Sawyer's flexible support are put through the alum, dried, and the final transfer is made in cold water to the albumen paper. I fully concur with Mr. Turner as to the beauty of the results obtained in this way; but I fear very much that the adhesion between the gelatine film and the albumen is very slight. The gelatine film, when hardened by alum, has lost to a great extent its sticky qualities, and the coagulated albumen possesses little or none. It would be a much safer plan, I think, to put the prints through the alum after the final transfer, and to make the transfer without drying the image on the flexible support, as is recommended by Mr. Sawyer. The safest plan would be to coat the surface of the print with gelatine, and to make the transfer without drying.

A Hundred Franc Brochure.

A Mr. Clary, of Algiers, has, after great labour and extensive travel, discovered a new way of lighting the sitter, which he proposes to communicate, to those interested, for a hundred francs. He has the endorsement of several of our photographic notabilities. If the readers of the News will look over their files, they will find somewhere among the reports of the Chicago Convention a paper by Carl Myers, of Homersville (New York State), in which Mr. Clary's new way of lighting is described.*

Carl Myers' Patent Universal Handscreen and Concave Reflector was advertised in the *Philadelphia Photographer* about a year ago. In the last number of the same publication can be found advertisements of "Bird's Handscreen," a contrivance similar to that of Myers'. The handscreen has been extensively used in the United States, in one form or the other, for several years.

FRENCH CORRESPONDENCE.

Progress in Mechanical Printing—Indian Photographs from Captain Waterhouse—M. de Courten on Copying Engravings — Dr. Ponza's Experiments with Different Lights on Lunatics—Elœococca.

On the 3rd of March the French Photographic Society held its monthly meeting, and on that occasion much attention was given to the subject of printing in greasy ink, and the production of carbon photographs.

M. Geymet exhibited a collection of prints of considerable dimensions, obtained by means of photo-lithography, being reproductions of some very fine views, drawn by M. Langeroc, a well-known photographer, who is likewise a landscape artist of talent.

M. Fortier presented the society with a volume which he has just published, and which is devoted to printing in greasy ink. Moreover, he gave a practical demonstration of the processes which he makes use of, and which are described in his book. We shall have occasion to return to this publication at an early date.

We ourselves exhibited a series of images which Captain Waterhouse had forwarded from Calcutta. They were views and scenes of Indian life, which in France is always regarded with some degree of romance. The works of this skilful officer were duly appreciated by the members, his name being well known in Paris; the pictures testified much ability and artistic taste on the part of their producer. They were examined with feelings of deep interest.

I have in my hands a very erudite work from the pen of M. le Comte de Courten upon certain difficulties presented in the reproduction of engravings by means of photography. I am certain that the readers of the Photographic News will be pleased to have a few extracts from it.

M. de Courten points out that one of the principal defects in clichés of this kind is the want of sharpness produced in certain parts, where the lines, instead of being altogether isolated, run together with the appearance of a half-tint. He thinks this defect may be attributed to two causes—to the faulty employment of the lens, and to letting the development go too far.

In the first place, M. de Courten has assured himself that the evil is caused by the phenomenon of diffraction. Thus when, in order to increase the sharpness of the picture, diaphragms of a lesser nature are employed, the defect is seen to become more and more marked.

It is known that light in passing through a narrow slit, or an opening of slight diameter, forms luminous bands of decreasing intensity, alternate with black spaces, instead of a single pencil of light which ought to be produced. A fine thread stretched before this species of diaphragm should produce a shadow, but the luminous rays contour the thread, and take the place where the shadow should fall. Moreover, in the case of white light, the lines are bordered with colours of the spectrum, a diaphragm of small dimensions applied to a lens of long focus covering a very wide surface; this has the effect of producing interference and diffraction.

It may be considered that each line is bordered with a kind of edging or margin impinging upon the line itself. With a little practice and good eyesight this is seen upon the ground-glass. The result is a great deal of difficulty in focussing.

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* See our last volume, pp. 381 and 389

Under these conditions one may be said to be in presence of a sort of chemical focus accidentally produced, and quite independent of the more or less perfect achromatism of the lens. The remedy consists in having larger openings, and in not forcing the apparatus to cover surfaces disproportioned to its focal length.

The phenomenon is, above all, remarkable when one works in diffused light. In the direct rays of the sun these inconveniences are far less marked. It is easy to focus, the pose is much shorter, and the feeble diffusion of light has less time to impress the sensitive film.

As regards the pushing of the development too far, M. Courten says:—"In order to give the requisite amount of opacity to the ground of an engraving, one is obliged to force the development, the action of which progresses at the same time in the clearer parts of the negative. The result is that the delicate lines are choked, and instead of a transposing in parts, there is a half-tone, in which the finer portions of the engraving are completely lost. This manner of proceeding is therefore defective."

M. de Courten recommends that one should confine oneself to developing the image in all its minor details, without minding the intensity, which can be obtained by other means.

In the reproduction of engravings, collodion giving a thin film is to be preferred to those yielding thicker images. After having developed with an acid iron developer, according to the formulæ in general use for the wet collodion process, you retard, by means of energetic washing, the action of the developer before the image has become intense, but is visible in all its details. The plate is fixed with hyposulphite of soda, washed with care, and then plunged, without loss of time, into a bath composed of—

Water	1,000 cub. cents.
Alcohol	50 "
Bichloride of mercury ...	10 grammes.

The bichloride is first allowed to remain in contact with the alcohol only, and a few hours previously to use, the water is added. The bath is shaken a little to agitate and equalise the action of the intensifier, and then allowed to stand for some time.

Here M. de Courten's communication comes to an end, but as soon I receive the continuation I shall hasten to put it before the readers of the Photographic News.

It appears from the recent experiments of Dr. Ponza, in Italy, who has been assisted in his researches by the eminent astronomer, Father Secchi, that light acts in a very energetic manner upon brain-affected patients according to the colour of the glass through which it falls. In a room lighted by windows of red glass, and painted inside of the same colour, was confined a lunatic afflicted with the utmost depression. At the end of three hours he was found to be gay and smiling. In a blue room a lunatic of a most obstreperous nature recovered his calmness within the space of an hour. A third lunatic, after having passed a day in a violet chamber, was pronounced so well that he was allowed to leave the asylum. At the present moment he appears to be quite cured. There is nothing astonishing in the circumstance that light penetrating the eyes should reach the brain, and modify its condition.

At one of the last meetings of the Academy of Sciences an account was given of an experiment, proving that the greasy and liquid matter, *elæococca*, becomes solid if exposed to the sun in a violet bottle, while it undergoes no change whatever if preserved in a yellow one. These are curious facts which are well worth noting.

Ernest Lacan.

Correspondence.

COPYRIGHT IN PORTRAITS.

Dear Sir,—I suppose the letters to advance the subject (cost of carbon printing) are coming—certainly none have appeared yet.

May I ask if, when the side issues mentioned by Mr. Bovey come to the front—space being more available—you will do something to help forward the subject of copyright in portraiture in relation to status. Nearly everybody is periodically cranky about the matter, and yet it continually gets shelved; when an influential deputation to the Exchequer authorities would probably induce them to grant a right to stamp all produced on payment of an annual sum. The revenue would gain, and photographers would be able to maintain their prices, because cheap copying (?) companies would cease to exist.—Yours truly, J. Macer Wright.

Sheerness, March 1st.

[An important preliminary to any legislation on the subject is needed. The matter requires carefully and fully ventilating. A comprehensive paper on the subject, clearly setting forward its equitable bearings as regards the sitter and the photographer, read before the Photographic Society, and thoroughly discussed, would doubtless aid in clearing up many points, so that if legislation were invoked, a definite case could be presented. Means of combined action in relation to professional interests are sadly lacking amongst photographers. Possibly the Photographic Society might be induced to approach the Legislature on such a subject.—Ed.]

SECURING GRADATION IN LANDSCAPES.

Dear Sir,—Another trifle on the subject of gradation in landscape photographs.

I have just got a Dallmeyer's flap shutter. Would it not be good to put it on the lens upside down, and gradually close upwards, instead of suddenly downward, in cases where the foreground happens to be very dark in proportion to the sky and distance? There have been so many dodges proposed lately for the full exposure of the foreground without over-exposure of the lights, that I have thought a good deal about it. A steady hand need not move the camera, supposing his shutter to be in good order. A fringe or zigzag, as in vignetting, on the bottom of the shutter, would much facilitate the matter.—Yours faithfully,

Harnham Cliff, Salisbury, March 3rd. Thos. Parkyns.

A PLEA FOR SILVER PRINTS.

Sir,—Some of your correspondents indulge in strong remarks with reference to the foolishness, and even the dishonesty, of those photographers who still continue to use silver for printing. I also notice rather frequent complaints that silver prints appear to be less permanent than they used to be. Now, is it not possible that the bitterness and disappointment that have caused these remarks and complaints may have resulted from other causes than the supposed inherent frailty of silver prints, which, we are told, is such that they must inevitably fade before long?

Permanence is a comparative term when applied to things human, and works of art are no exception, as a visit to the winter exhibition of the Academy would satisfy any one. He would be a rash artist who would guarantee the absolute permanence of his oil paintings or his photographs. Yet I believe that with due care in production and preservation, both may last as long as they are required, with comparatively few exceptions. I have had to do with the gradation of some hundreds of thousands of photographs, and it is my firm belief that when they fade, a reason can be given for that misfortune without assenting to the idea that it is their nature to do so, and an unavoidable fate. Of course any photograph, however well prepared, may be destroyed by exposure to noxious gases, &c.; but if works of art are valued, care should be taken of them. An engraving may be ruined by mildew quicker than a photograph, I believe.

Allow me to suggest two causes for the recent complaint of instability, one chemical, the other practical:—1. For some time past it has been the custom to recommend the addition of carbonate of ammonia to the fixing bath. I am not going to object to the theory on which this addition to the fixing bath is recommended, but practically I think it objectionable.

Some time since, disgusted with sulphide of potassium, I sought other ways of saving the silver, using copper, zinc, and other substances; not only pure metals, but also compounds, and, besides chemical agents, I tried electricity, applied in various ways. I was struck by the fact that in any case the addition of carbonate of ammonia facilitated decomposition beyond anything ever tested. Now, as nitrate of silver and chloride of gold both decompose hyposulphite of soda, and also in many toning baths there may be a trace of acid, which is another decomposing power, and as printers seldom work with scientific accuracy, it seems unadvisable to use a salt which, however good under perfect conditions, fearfully exaggerates slight errors; especially as we can secure the necessary alkalinity with carbonate of soda, which is very much safer than ammonia.

2. The practical evil alluded to in the last sentence, the want of scientific accuracy in printers, may perhaps be best described by a short narrative.

A photographer of good standing engaged at head-quarters a man whose referee seemed quite satisfactory. This was his method of proceeding, described by an eye-witness:—He put his prints into the fixing bath, and left them alone while he attended to other matters, preparing to leave for the evening; when he judged that they had had enough, he shifted them to the washing machine, and departed. Can you wonder that one at least of his late employers prefers carbon printing? Would carbon prints, produced with the same amount of care (?), be permanent?

Let the term "dishonest" be applied to such men, and not to those who conscientiously use a process which they have known for years.—Yours truly, $AgO\ NO_5$

REDUCTION IN THE PRICE OF SILVER.

Dear Sir,—I feel that no apology is needed for bringing under the notice of the profession the great fall that has taken place in the market price of metallic silver during the last two or three years, while the charge made by the wholesale chemists for the nitrate remains the same as before this fall took place.

When silver cost 5s. 1d. per ounce, the nitrate was sold (wholesale) at 3s. 4d.; 108 ounces of silver made 170 of nitrate, and yielded the producer 17s. 8d. to pay for fuel, labour, and profit. The same quantity now, owing to the reduction spoken of, yields £4 0s. 8d. If, therefore, the former was a just profit, the latter must be excessive. I have calculated that the proportional price of the nitrate should be 2s. 11½d., and that would yield the same profit as 3s. 4d. formerly gave. That fuel and labour are dearer now is granted, but against that there is the smaller capital required, being in the proportion of 4s. 6d. to 5s. 1d., and if, say, 3s. per ounce were charged, there would also be the extra halfpenny per ounce to cover it.

A photographic dealer in this town lately wrote to a manufacturing chemist to ask if they would reduce the price, but they intimated that they did not intend to do so. If this is still the ground they intend to take, it will rest with photographers to decide if it would not pay them to make their own nitrate again, as they did in the long ago; and as they could just as easily keep it in solution as to crystallize it, the trouble of the latter operation would be avoided.

It perhaps behoves me to state that I do not guarantee the absolute correctness of the figures, not having the means here of getting to know the exact market price of silver; but I have ventured to take the prices quoted, viz., 5s. 1d. and 4s. 6d., as an approximation to the truth; and trusting this letter will provoke a controversy on the subject.—I am, dear sir, yours truly, John W. Burton.

Leicester, March 1st.

Dear Mr. Editor.—Mr. Ernest Seyd, in his interesting paper read before the Society of Arts on silver currency, says that there are 200 millions of surplus silver in Europe which must be demonetised. It is notorious that there are 250 millions surplus in India, that the Indian exchange is the loss of one million annually to the Government, that the shilling is only worth 9¾d., or 53½d. per ounce, and that if it falls much lower, it will be an impossibility to maintain it as a material for subsidiary coinage, because coins could be made at a profit by others than the Mint, of precisely the same value. Added to this, what is not the much-puffed carbon going to do? Is it not going to oust silver prints from the market? What, then, will become of silver? When we take into consideration the great quantity absorbed in photography, it will become a greater drug than ever. Now, can you tell me, Mr. Editor, why the price of nitrate of silver remains unchanged?

This is a very serious matter to my brother photographers, and I hope some one will take the matter up without further delay.—I am, dear sir, yours very truly,

A. C. Burgess.

9, *High Street, South Norwood, March 7th.*

[It is probable that a reduction will be made in the price of nitrate of silver eventually. Probably much of the nitrate of silver in the market was made when silver was at the old price. In any case, most persons are aware of an occult law which maintains the price of a manufactured article long after the price of the raw material has been reduced. The price of bread at the bakers' does not decline until long after a fall in the price of corn, although it often rises at the first intimation of a probable rise in corn! We shall probably shortly hear of the public asking why the price of portraits is maintained, when silver, the presumed chief item of cost, has fallen!—Ed.]

DETAILS OF CARBON PRINTING.

Dear Sir,—You would greatly oblige me and a good many more of your readers, by giving us a formula of carbon printing. I have read a good many arguments in your journal relating to the respective cost of carbon and silver printing, but remain in the dark as to the carbon process. It would be a great boon to us photographers in general, if (as well as advocating and discussing the various processes) you would give us some idea of the manipulation, &c., through your excellent journal.

I am convinced that there are a great many photographers who would eagerly embark in carbon printing, if they only knew any substantial formula.—I remain, dear sir, respectfully, J. C. B. O'Reilly.

[During the last few years our pages and our Year-Books have teemed with articles containing detailed formulæ of carbon printing. The simplest and best plan for beginners is to obtain the "Manual" published by the Autotype Company, which contains full instructions in every department of carbon printing.—Ed.]

INDIA-RUBBER LINED BATHS.

Sir,—In "Echoes of the Month" of March 3rd, I find a method of making india-rubber lined baths.

I shall feel obliged if "Old Photographer" will inform me and others, through your News, where the sheet india-rubber can be purchased, and the price, I am now about making myself a bath on that principle, which I think would be a great help to all landscape photographers.—Your obedient servant, A Young Landscape Photographer.

P.S.—I should also like to know where the paraffin wax that Mr. R. Kennett tells us of in the Year-Book can be purchased.

[Suitable sheet india-rubber may, as a rule, be purchased of all dealers in india-rubber. We learn on inquiry of the "Old Photographer" that his was purchased, so far as his memory serves him, of Burgess and Key, Newgate Street. Solid paraffin may be obtained of many chemists, and at some oil shops, also at many photographic warehouses.—Ed.]

FIXING IN THE LIGHT.

Dear Sir,—While staying at a friend's a few days since, I happened to glance at *Ganot's Natural Philosophy* by E. Atkinson, Ph.D. F.C.S., and in looking through the book I came upon pages 388 and 389, relating to photography, where I found the following passages. Speaking of the negative after development, it says, "The parts on which light has not acted are still covered with iodide of silver, which would also be affected if the plates were now exposed to the light; it is accordingly washed with a solution of hyposulphite of sodium, which dissolves the iodide of silver, and leaves the image unaltered."

Secondly, after printing, it says, "In order to fix the picture, it is washed in a solution of hyposulphate of sodium, which dissolves the unaltered chloride of silver. The picture is afterwards immersed in a bath of chloride of gold, which gives it tone."

Now, in reference to the first sentence, I should be glad to know if, after development, the light has any effect upon the plate, as I almost always clear the negative in the light; but since seeing the passage referred to, I have cleared negatives in the dark room, also in bright light, and I cannot find that the light has the least effect upon the plate.

With reference to the latter sentence, nothing can be said but that it is a great mistake, and might possibly cause beginners a great amount of trouble and annoyance.

In books by such gentlemen we expect to find something that can be relied upon, and thinking that such mistakes ought to be corrected, I have had the boldness to intrude upon your valuable space.—I am, sir, yours, &c.,

F. J. F.

[No visible effect is produced by light upon iodide of silver alone; but as all negative collodions now contain a bromide as well, the surface is sensitive to light. This you may easily prove. Take a developed and washed negative, cover up one half, and expose the other half for a quarter of an hour to sunlight. You will find the exposed half deeper in colour throughout, and much more intense than the protected half. The action for a minute or two in diffused light will not be noticeable, hence there is no serious danger in fixing the negative in daylight. The second statement is inexact. Toning after fixing has been practised in some cases many years ago. A novice should not use the general description given in a work on "Natural Philosophy," as an elementary instruction book. It would have been much better, of course, if the book had been more accurate.—Ed.]

URANIUM IN THE NITRATE BATH.

Sir,—May I suggest to Mr. Peters that he will find it preferable to make a fresh bath, in the proportion of about sixty grains of silver and ten grains of uranium (although this, of course, depends upon his collodion), without any nitric acid, to adding the uranium to an old bath. Like himself, I found that the negatives were certainly improved by the uranium, and although with the ordinary developer it did not shorten the exposure, I think if a stronger developer, with the addition of about one drop of liq. ammonia to eight ounces, also formic acid, &c., an improvement will be found in the rapidity also. It is almost useless attempting to give exact formulæ, for the chemicals altogether vary very much; for instance, collodion, nitrate of silver, and especially nitrate of uranium, purchased of Mr. A., are often very different compounds from those of Mr. B. I found, however, one disadvantage; so far as my own practice was concerned, it does not seem to work well with a chloride in the collodion, and as I have found great advantage from the use of certain chlorides, further trial with the uranium was somewhat reluctantly discontinued.—Yours truly,

J. Barker.

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The monthly meeting of this Association was held on Tuesday evening, the 29th ult., at the Free Public Library, William Brown Street, the Rev. H. J. Palmer, vice-president, in the chair.

The minutes of the previous meeting were read and confirmed.

The Chairman exhibited an "excelsior" camera, attached to which was a box holding twelve prepared plates. By a clever arrangement the plates were lifted as required into the camera, registering, at the same time, the plate used. The camera, with its various ingenious arrangements, was examined by the members with much interest; but it was thought that, for large cameras, some special means to prevent vibration would have to be taken in windy weather.

Mr. Ellerbeck exhibited a collection of lantern slides of seaweeds, and some carbon transparencies taken on talc. Mr. Ellerbeck thought it would be advisable that the Association should have a collection of lantern slides which the members could borrow for private use on application to the secretary. He was sure that donations to the collection would be readily given, and he should be happy to present to the Association some slides for that purpose.

Mr. E Phipps exhibited some plates made with washed bromide of ammonium emulsion prepared eighteen months previously, which showed that the emulsion could be relied on for keeping.

The Chairman exhibited some photographs of his apparatus used in preparing gelatine plates.

The meeting was shortly afterwards adjourned.

Edinburgh Photographic Society.

An ordinary meeting of this society was held in 5, St. Andrew Square, on Wednesday evening, the 1st inst., the president, Dr. Thomson, in the chair.

The minutes of previous meetings were read and approved, and Messrs. John Gowan, J. Wallace, James Walker, James Anderson, and Liudsay Howie were admitted ordinary members.

A paper, by the Rev. J. H. Palmer, of Wallasey, entitled "Experiences in Working the Gelatino-bromide Emulsion," was read, and listened to with marked attention (see page 110).

Mr. Ross presented to the society, in the name of Mr. Kennett, several prints, including a fine photograph of himself, from gelatine negatives, all of which were much admired, as illustrations of the capabilities of the process. He (Mr. Ross) also stated that Mr. Palmer had, in his studio, prepared, exposed, and developed a number of the gelatine plates, and some of them were very fine. They were quite as rapid as wet collodion, and if they could be made as certain, he should have no hesitation in abandoning wet collodion altogether.

Mr. Lessels had tried the gelatino-bromide plates, but had not succeeded. Possibly his failure may have arisen from unsuitable light in his dark room, or some lack of experience in manipulation. He was, however, very anxious to get really rapid dry plates for photographing interiors, and now that Mr. Palmer had given so clear an exposition of his method of working, he should give it another trial.

The President had studied with no little interest all that had been written about the process in question, and had got some of the pellicle from Mr. Kennett; but thought that some time would elapse before it would supersede the processes at present in use. Gelatine would be found more unmanageable than collodion, as it was so readily affected by variations in temperature, variations that were not always easily controlled. The outcome of his own experience was, that in his hands the most thoroughly satisfactory results were got with the beer and albumen plates. No doubt they required a somewhat lengthy exposure, but that was fully compensated for by the certainty and beauty of the result obtained. While he admitted that the process was slow as compared with some others, he had often made plates sufficiently sensitive to give fine cloud effects in his landscapes.

Mr. W. Neilson thought the present running after rapidity in dry plates was a mistake. Unless they could be made absolutely instantaneous, a thing not yet claimed for any dry process, a long exposure was often much better than a short one. He had more than once secured good results in a heavy wind, with very long exposure; the trees, although moving very much, seem always to return to the same place, and admit of being impressed with considerable sharpness and definition.

Mr. **Alex. Nicol** spoke in favour of the beer and albumen; he had employed it frequently, and always with success, which was more than he could say of any other process, while his exposure varied from two to three minutes, which he thought was quite short enough for any ordinary purpose.

Mr. Bow thought there was one feature of considerable importance in the gelatine process which was being overlooked—the absence of the smell of ether and other volatile bodies, so disagreeable to some operators; and he was of opinion that, other things being equal, this should be a strong recommendation to the gelatine.

Several other members spoke on the subject; and from the general tenor of the discussion, the opinion seemed to be that the gelatino-bromide possessed some advantages, as well as some disadvantages; but there was, so far as yet known, nothing in it likely to lead to its superseding the processes now in general use.

Mr. **Turnbull** showed two large prints of excellent quality, by Mr. McLeod, of Newark, which were much admired.

On the motion of Mr. Ross, hearty votes of thanks were awarded to the Rev. Mr. Palmer for his admirable paper, and to Mr. Kennett for his contribution to the society's album; and the meeting adjourned.

Talk in the Studio.

Limits of Photography.—Here is a point which customers generally are very apt to forget. Photography does not make "the human face divine," it only reproduces it in artistic miniature. The photographer has not even the responsibility of a painter. Photography cannot well err, though the pictures may vary with the light and in finish. An oil painting may conceal a squint, turn a snub nose into a Grecian or Roman, and at the painter's touch rejuvenate the middle aged and give an air *distingue* to the commonplace. Your plebeian shall look patrician under the touch of a Sir Joshua. But the photographer has no such artistic and amiable discretion. The pimples on the "bottle nose" he cannot away with, neither can he fill out the "lantern jaws." He cannot turn a Pipchin into a Lola Montez, nor make the Honourable Mrs. Skewton as comely as her daughter Edith. The eyes that squint will squint in the photographer's room as much as in the drawing room. The nose that is snubby will be snubby still, and the mouth that suggests "chops and tomato sauce" will not wear in the carte-de-visite the ungastronomic lines of an archangel's. It is too bad to blame the poor photographer for the facial accidents of nature. Of every face, as of the poetic soul, it may be said, "*nascitur non fit*," and if it is a bad fit, it is not fit that the artist of the camera should be blamed. Yet so unjust are those who are not favourites of nature that they would occupy the time of the artist in reproducing their uncomeliness for the benefit of society, and then refuse to pay him because they are not good looking. Your "pig-headed" man demands that he shall come forth in carte an Adonis, and the spinster of uncertain age expects to be made a Venus.—*Brooklyn Eagle*.

To Correspondents.

R. Smith.—The only practical difference in the two methods consists in the possible interruption of the light at the eaves in your own plan, No. 1, by the junction of the side and roof, which junction would be absent in the American plan, No. 2. For the colour of interior, any neutral colour pleasant to the eyes. We do not like white, for whilst, of course, it gives an effect of great light, it really produces a number of reflections not under control. We prefer to obtain all the reflected light required by means of reflecting screens placed just where we require them.

Commie.—Imperfect waxing of the plate is the most probable reason for the print sticking; or at times the same result will follow attempting to move it too soon. Try modification in both these points. With your enthusiasm you will certainly succeed if you persevere.

Florence.—The calotype process possesses undoubted advantage in the lightness of the sensitive material to be carried, and the process once mastered is not more difficult than the collodion process; but you must bear in mind it is practically a new process to acquire, requiring great care in all the manipulations. Possibly the use of Herr Warnerke's sensitive tissue, which is just as light as sensitive calotype paper, may answer your purpose. Should you wish to work the calotype process, you will find various detailed articles of instruction in the News and in our Year-Books. In the Year-Book for 1870, p. 82, you will find an article which will probably just meet your necessities.

One Who Tries.—We have not examined the special lens to which you refer, but it is quite possible that its general construction for rapid work may render necessary the modification in the position of the stop. In its present position it doubtless admits more light, and that is, of course, the important element of rapidity. 2. There is no easy method of removing the red foggy deposit, which comes whilst intensifying, which does not involve risk of injuring the negative. The best mode of making it non-effective is to change its colour. This is done by submitting the negative for a short time to a solution of bichloride of mercury, which turns the red deposit white, without altering the image to any extent, and so prevents its having any appreciable effect in printing. 3. We have never noticed a tendency in the negative film to blister when it has been treated with iron-citro-silver intensifier. Such blistering has occasionally occurred in our hands when the intensifying has been pushed or prolonged for any cause.

G. Smith.—The dull effect and lack of purity in the white of your collodion transfer are due to a slight degree of fogging, and this may be due to many causes. It may arise from the use of a new collodion, or from the presence of light in your dark-room, or from the use of a newly made iron developer with insufficient acid. You do not say anything of the formula employed, and we cannot, therefore, suggest which individual part of it is in fault. As a rule, a ripe old collodion is desirable (a pyro developer), and not over-prolonged development. The instructions given a few years ago in our pages for producing the photo-crayons introduced by M. Sarony will aid you in producing good results. 2. The small glittering spots on the film are due to imperfect contact at such points between the transferred film and the paper on which it rests. 3. Precisely the same kind of image is required in a developed collodion image on opal glass as that required for transfer to paper, and all the same operations and precautions require attention. The image which looks well on looking through, and not when looked at, is generally somewhat over-developed.

A New Subscriber.—The silver solution will not take any harm in a glass or porcelain bath, if properly covered to protect it from dust or other contamination. Be careful, in using it after standing a while, to remove any floating scum by means of a strip of clean blotting paper. 2. It is not a common custom with the proprietors of large establishments to take apprentices or pupils; but it is done occasionally. There is no fixed standard of terms: they vary with circumstances.

J. C. Banyard.—If you could secure three or four feet additional width in your room it would be an improvement, and give you much more convenience and facility in producing good results.

N. R.—As a rule the Photographic Society avoids dealing with commercial questions, its chief business being with photography as a science and as an art. There are undoubted occasions when the interests of photographers, in a professional aspect, seem to require united attention and combined action; but no facilities for such action exist. The American National Photographic Association takes cognizance of such questions. In many respects it has been a success, but not an unqualified success. There was no convention held last year.

G. F. L.—An increase in the proportion of iron in the developer does not render necessary an equal increase in the amount of acetic acid. With a fifty-grain developer we should not use more than twenty minims of acetic acid, and with a ten-grain solution we should use no less; because working slowly, the acid would be necessary to prevent fog in the prolonged operation.

A Subscriber.—There are various modes of giving a matt surface to glass, for use as a substitute for ground glass. A varnish of benzole and gum damma, to which a little white wax has been added, answers; several of the retouching varnishes, for which we have given recent formulæ, answer well; but we have seen no finer results than those produced by the method described in Mr. Gardner's letter in our last.

Wm. Colquhoun.—Thanks. In our next.

Thos. Sims.—Your letter reaches us too late for this week. In our next.

Fairplay.—In our next.

E. L.—In our next.

Several Correspondents in our next.

The Photographic News, March 17, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Application of Light to Telegraphic Purposes—Micro-Photographic Enlargements for Instructional Purposes.

Application of Light to Telegraphic Purposes.—There have been many plans of telegraphing by means of light brought forward lately which, by reason of their being entertained at all in the presence of the electric telegraph, must be deemed of considerable importance. A complete system of signalling indeed exists in our army by means of shutters in the daytime, and artificial lights burnt at night, but, as may be supposed, the distance at which such signals can be seen is rather limited. The use of coloured lights is of no value whatever for making such signals, for, as we recently pointed out in these columns, white light is far superior in its penetrating qualities to any coloured ones. At Genoa some little time ago a few experiments were made to ascertain the relative value of different lights, and a series of coloured lanterns were placed upon the beach for observation by a party who receded from the coast in a boat to view their effect. The lanterns were white, red, green, yellow, blue, violet, &c., and it was found that very soon only three lights remained visible to the observers, the white, the red, and the green Of these the green remained visible for a considerable time, but it soon began to look like a pale white light, the green rays failing to penetrate to any distance. The red light was visible after the green was no longer seen, but the white was visible by far the longest of all. These are the three lights which, as everybody knows, are used on our lines of railway, but it is questionable whether we should not adopt as the danger light that which is the most vivid, viz., the white; the practical objection to such a course being, we suppose, the circumstance that white lights are more commonly used everywhere than red ones. But by far the most penetrative of all light signals are those of the sun telegraph, a method that has been employed, it is said, for ages past, but to which attention has more recently been called by Mr. Mance, of the Persian Gulf Telegraph Department, who seems to have elaborated a system of some value. Should the plan, which, no doubt, many of our readers are conversant with, be adopted by government, it is not impossible that photography may be employed to record the signals, the latter being marked upon a strip of sensitized paper in the same way as signals are recorded by the ordinary Morse telegraph apparatus. Mr. Mance employs, in a word, reflected sunlight for his telegraph; and how vivid this is, everybody knows who has seen windows lit up by the declining sun. A burning spot of the most brilliant nature is produced, but only in the case of the observer standing at a proper angle to the mirror. Mr. Mance claims this as an advantage, for, as he states very truly, two people, or two armies at a great distance, might signal to one another, without the enemy or third person being aware of the circumstance. The sun rays reflected in this way, as may be supposed, are visible at a much greater distance than any other object could be, and their vivid character renders them unmistakable. Mr. Mance goes further, and suggests, by moving his mirrors, causing a beam of light to shoot right up into the heavens, which would be visible even when the station making the signal could not be observed, either on account of distance or position. This kind of sun signalling would, likewise, be invisible to any but those at the two particular points. The employment of the sun's rays in this manner has, as we have said, been made use of before for signalling purposes. Thus we are told that tribes of Indians in North America frequently employed light in this direction. They found out the use of the mirror, and from a lofty range of mountains, through gaps in the forest, they made use of a piece of glass to flash many miles across the country a signal of their intentions and ideas to another body of Indians in ambuscade. A similar application of light was made, it is said, by Admiral Sheriff some forty years ago, when he was in command of the fort of Gibraltar. He had a friend, it appears, living at Tangier on the African coast, and the Admiral was enabled to correspond, right across the straits, by means of an ordinary bedroom looking-glass. The two friends had so regulated the angles of their mirrors that the minute specks of light were clearly visible across the strip of the Mediterranean which separates Europe from Africa. This is certainly one of the most interesting, because most simple, applications of light that we have heard of.

Micro-photographic Enlargements for Instructional Purposes.—We have already called attention to the aid which photography may give in instructing students of science, especially in the case of medicine. In Paris, the Abbé Moigno some time ago gave a series of lectures and demonstrations to exhibit the usefulness of enlarged photographs upon a screen when one has to deal with large audiences. In the case of microscopic preparations, the use of photography is very obvious, and we are glad to see that several medical gentlemen in this country are paying attention to the matter, in order to employ the art for teaching in medical schools. Under ordinary circumstances, in a class where students have to be shown some minute structure, it is necessary for all of them to possess a costly microscope, or at any rate to have a dozen or so of such expensive instruments to each score of students. With a micro-photograph, however, and an enlarging apparatus, it is possible to throw upon a screen, at once, an enlarged diagram of the object in question, which is seen by all at the same time. This plan of proceeding has two important advantages over the use of microscopes in a class. In the first place, only one object is necessary, and where it is a question of a rare specimen, this is a matter well worthy of consideration; secondly, the professor or lecturer can point out the details to the whole class at once, with more distinctness than would be the case if the student had to look through the microscope meanwhile. Dr. Urban Pritchard, of King's College, who is turning his attention to micro-photographic diagrams, demonstrated the other night, at the Royal Society, the great value of such productions. In using ordinary diagrams, one cannot dispense with the microscope, but on the contrary, it is always necessary under the circumstances to have close at hand such an instrument, in which the real thing is to be seen, for comparison with the diagram. If, however, enlarged micro-photographs are shown instead, you may dispense altogether with the series of microscopes, which are otherwise required to prove the veracity of the diagrams. Dr. Pritchard, whose researches on the ear are well known, desired to show the Fellows of the Royal Society that the rods of Corti, in the internal auditory apparatus, were graduated, and, for this reason, were capable of appreciating the different sounds, a fact which had not previously been pointed out. By enlarging his minute specimens he was enabled to do this, and to point out how the structures in question increased in size, thus demonstrating at once the theory he desired to prove. We believe it is Dr. Pritchard's intention to obtain photographic transparencies of all his microscopic preparations relating to the human ear, so that they may be exhibited upon the screen of a lecture-room without trouble.

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VARIOUS MATTERS CONNECTED WITH THE SUCCESSFUL PRODUCTION OF NEGATIVES.

BY W. T. WILKINSON.*

A very important part in the production of a good negative is a clean plate. "Pooh!" says some one; "easy enough. If you have new plates put them into a little acid and water, or, if varnished ones, put them into a hot solution of washing-soda." Now, this is wrong.

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* Read before the South London Photographic Society.

With new plates the principal difficulty to be contended with is grease. Put a greasy plate into acid, and the grease is rendered insoluble, and very difficult to remove; and if it be put into a solution of potash the grease is converted into soap, which is quickly removed by rubbing with a piece of flannel under the tap. The plate may now be put into acid, after which it is well rinsed and put into a rack to dry. Varnished negatives may be treated in the same way, as a few hours' immersion in a solution of potash is sufficient to loosen the most tenacious film.

Failures in operating should not be allowed to dry, but the film should either be washed off there and then—and, by the way, a small squeegee is an excellent thing for this purpose—or else the plates should be immersed in water till an opportunity offers; then, after cleaning off the film, proceed as above.

There is one thing worthy of very special attention, namely, never to leave plates standing in a heap with liquid between them, more especially either alkali or acid, as the solution, in evaporating, attacks the surface of the glass and stains it, after which no amount of cleaning short of repolishing will make it fit for the reception of a negative. Always let the plates dry in a rack, not in contact with each other; then the liquid drains away, leaving the plates dry. If proper care were bestowed upon the plates, it would be astonishing how few bad baths there would be in the course of the year.

The next subject is the negative bath. If all the matter that has been written about the negative bath were collected, I fancy it would make a rather large volume; and still we are not content. In the two almanacs for the present year there are fourteen different methods of managing the bath; but of all these, that described by Mr. H. J. Burton is the best and simplest. As I work daily with baths prepared in the same manner, I cannot do better than give you a resumé of it.

First of all, work the bath until the negatives show signs of pinholes; then remove it from the holder, and filter half of it in the dark. Return to the holder (which, of course, has been well washed in the interim), and add to it an equal bulk of a plain forty-grain solution of nitrate of silver dissolved in sunned and filtered rain water, to which a little silver has been added. The bath is now ready for use, and will be found to give negatives far better than would be obtained from any new bath.

The remaining half of the old solution may be boiled down and crystallized. The crystals are washed and dried, and then can be used as ordinary crystals, for when obtained in this way they are quite free from iodide, acid, or organic matter.

Do not let it be supposed that I condemn sunning the bath, for this is not the case; but if a bath, either all or in part, which has been in use is taken into the light, an action is at once started, and unless that action be allowed to go on till completed it is hopeless to attempt taking good negatives. Therefore, if a bath is intended to be used again directly, keep the light from it; but if time can be spared, give it all the light possible.

After filtering a bath: let any photographer who uses paper for the purpose of cleansing the solution properly just try for once the stuffing of the funnel with cotton-wool (which should have a little alcohol and ether run through, and then washed with water), and see the difference between the bath filtered so and through paper.

In conclusion, I would like to say a few words upon bath-holders. All of you know how soon a dark slide wears out on account of the solution from the plate rotting it, because it is almost impossible to drain the plate properly when using the dipping bath. Mr. Abel Lewis, in the two almanacs, gives a description of a draining-box for sensitive plates. I can recommend a better piece of apparatus than that, which, in addition to being a good draining-box, has the further advantage of saving silver, and also of being about the only piece of photographic apparatus that in its working is perfection, and that is a horizontal swing bath. Once used, it will be always used; but, like a good many more things in photography, its greatest declaimers are those who never worked with it, and, very likely, never saw it.

THE COLLODIO-BROMIDE EMULSION.*

BY M. N. MILLER, M.D.

The President of this Society announced, last spring, the principle of adding a chloride to a bromide emulsion in which an excess of silver had been allowed to remain for a certain period, thus restoring the same, and preserving it at a maximum degree of sensitiveness.

That an emulsion containing an excess of silver, and having after a time passed into a state in which fogged pictures only can be produced, can be restored by the subsequent addition of a chloride, is indeed a most remarkable fact. I have repeated this experiment frequently, and always with nearly the same result.

I commenced my experiments with this process last summer, and during the hot weather did not succeed perfectly. I was inclined, therefore, to doubt the value of this form of emulsion. Late experiments have so far confirmed the views of Mr. Newton that it is only just that I should record the results of some of my trials. In the process as presented to this Society, the emulsion was allowed to remain with an excess of silver about eight hours, and then the chloride was added. To determine whether this was a point of value I made the following experiments:—

To 8 ounces of thick plain collodion I added 96 grains of bromide of cadmium, and, after solution, 136 grains of nitrate of silver. This plain bromide emulsion I divided into eight equal parts, labelling them Nos. 1, 2, 3, &c. No. 1 was left without further treatment. To No. 2 I added two grains of chloride of calcium in about ten minutes after the silver. In an hour I added the chloride to No. 3. No. 4 was treated to the chloride when one hour old. No. 5 received its chloride in four hours; No. 6 in six hours; No. 7 in seven, and No. 8 in eight hours.

Results.—No. 1 gave good results soon after being made. In an hour or two its sensitiveness had increased considerably, and so continued to increase up to about five hours, when it began to fog, and then rapidly became useless. In this state the films would show fog immediately after applying the plain pyro., and the image would become totally obscured. No. 2 was tried after the chloride was added, and gave good negatives, but was perceptibly slower than No. 1. This emulsion remained *in statu quo* for several days, when I accidentally spoiled it. From other experiments I have no doubt it would have made a good keeping emulsion, but very insensitive. No. 3 gave clear pictures as soon as made, but soon lost sensitiveness, and at the present time, now a month old, will make clear pictures with very long exposure. No. 4, which received its chloride in one hour after the addition of the silver, was tolerably sensitive and clean, but now requires ten times the ordinary exposure. No. 5 gave foggy pictures when new, and was quite sensitive. The fog gradually decreased, and in four days disappeared, and is now in good condition. No. 6 fogged when one hour old, but in twenty-four was clear and quick. No. 7 was spoiled by a dirty phial; but No. 8 fogged to the degree of total obscuration of the image when new. In ten hours the fog had disappeared, and made a fine working emulsion. From these experiments I conclude that the propriety of excluding the chloride for a time arises from the fact that the union between the bromide and the silver is a slow process, and, until this chemical union is thoroughly effected, the chloride should be withheld. If the latter is added with the bromide the chloride will first unite with the silver, leaving the bromide uncombined, if there be an excess of either one. And we must have a slight excess of one of these salts in an emulsion with keeping qualities, or, at least, an exact equivalent of all the salts. It is absolutely impossible to calculate and weigh such chemicals, and have the result an exact equilibrium. It is preferable, therefore, to add a slight excess of the chloride, which does no harm, even if it does not contribute to the perfection of the emulsion.

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* Read before the Photographic Section of the American Institute. Condensed from *Anthony's Photographic Bulletin*.

Experimenters working this process should adhere to all the formulæ as given. The tannin preservative does not work well with this emulsion. I always wash off the preservative before allowing the plates to dry. I believe the organifier has done its work when the plate leaves it, and its presence is no longer needed.

In making transparencies by this method, it is best to develop only until the detail is out, and then tone them slightly with the iodine, silver and iron intensifier.

ON THE REACTION OF RED FERRICYANIDE OF POTASSIUM UPON METALLIC SILVER, AND ITS INFLUENCE UPON SILVER NEGATIVES AS AN INTENSIFIER.

BY DR. J. M. EDEN.*

A little while ago Captain V. Toth and myself occupied ourselves with the matter of intensifying silver negatives by means of ferricyanide of potassium (see Photographic News, p. 100). The theory of the action upon metallic silver of a mixture of ferricyanide of potassium with a solution of metal (as in the case of the uranium and lead intensifying processes) is not thoroughly known, although such information is certainly of importance from a practical point of view.

I studied the reaction, therefore, very closely, and found it to be in accordance with the under-mentioned theory, without, as Grüne has assumed, the physical properties of the finely divided metal particles having any influence whatever.

A somewhat concentrated solution of pure ferricyanide of potassium was allowed to remain for several hours upon a still moist film of silver, which had been freshly reduced from nitrate by means of iron, and thoroughly washed. The colour of the silver changed to brownish-white. The solution contained, according to this, besides red, also yellow ferricyanide, and was free from silver. The insoluble residue contained no potassium, and showed, when dried in a vacuum over sulphuric acid, the following composition:—

Atomic weight.	Calculated per-centage Composition.	Found.
4 Ag = 432	67·09	69·73
Fe = 56	8·69	7·96
6 Cy = 156	24·22	
644	100·00	

The composition, therefore, approaches nearly that of ferricyanide of silver, but appears to have absorbed a part of the silver in the metamorphosis, which accounts for the large amount of silver found.

To satisfy myself that the equation—

$$\underset{\text{(Ferricyanide of potass)}}{2\text{Kg Fe}_2\text{ Cy}_{13}} + \underset{\text{(Silver)}}{4\text{Ag}} = \underset{\text{(Ferrocyanide of potass)}}{3\text{K}_4\text{ Fe Cy}_6} +$$

$$\underset{\text{(Ferrocyanide of silver)}}{\text{Ag}_4\text{ Fe Cy}_6.}$$

was correct, as the analysis of the silver combinations warranted the belief, I again allowed some ferricyanide of potassium to work in the manner above described upon freshly precipitated silver, and then determined how much ferrocyanide in the solution was present as ferrocyanide of potassium, and how much was combined with the silver. Analysis gave the following results:—

1. Into the solution went 0·439 gramme of ferrocyanide of potassium (determined by titration with permanganate of potash).

2. From the insoluble silver compound the ferrocyanic acid was separated by treating the solution with very dilute hydrochloric acid (chloride of silver being formed), and by titration with permanganate of potash, its amount determined, which corresponded to the 0·146 gramme of ferrocyanide of potassium.

From these figures it is clear that the decomposition is in accordance with the above equation—that is to say, that from two atoms of ferricyanide of potassium under the action of metallic silver, three atoms of ferrocyanide of potassium and one atom of ferrocyanide of silver are formed, so that three times more ferrocyanide must be found in the solution than in the precipitate, which my experiments prove to me to be really the case.

If the reaction is supported by heating the fluid, then a complicated decomposition takes place; the precipitate, as also the solution, becomes of a greenish-blue tint; a smell of cyanic acid is observable, and a considerable portion of the silver passes into the solution. This decomposition is of some interest to the practical photographer, for, were it otherwise, modifications of the process of sensitizing with ferricyanide of potassium might be elaborated. If potassium were found in the silver precipitate, and the following equation were correct, viz.,

$$\text{K}_6\text{ Fe}_2\text{ Cy}_{12} + 2\text{ Ag} = 2\text{ Ag K}_3\text{ Fe Cy}_6$$

then, in the uranium and lead intensifying process, an application of ferricyanide of potassium would be permissible, the potassium in the silver precipitate being substituted for uranium or lead.

Assuming this to be the case, Captain Toth and myself made this experiment before ever we had undertaken our investigation into the matter of the action of ferricyanide of potassium upon silver; and what was assumed *a priori* actually occurred. By pouring over a negative some red ferricyanide of potassium, and further treating it with nitrate of lead, no intensifying could be produced with the lead.

If a lead or uranium salt mixed with ferricyanide of potassium is poured upon a silver negative, there ensues a secondary action of the yellow ferricyanide, and a precipitate of ferrocyanide of lead is formed.

$$\text{I. } 2\text{K}_6\text{ Fe}_2\text{ Cy}_{12} + 4\text{ Ag} = 3\text{ K}_4\text{ Fe Cy}_6 + \text{Ag}_4\text{ Fe Cy}_6.$$

$$\text{II. } 3\text{ K}_4\text{ Fe Cy}_6 + 6\text{ Pb (NO}_3)_2 = 3\text{ Pb}_2\text{ Fe Cy}_6 + 12\text{ K NO}_3.$$

A mixture of ferricyanide of potassium and oxide of iron salts behaves in the same manner. If, however, it is desired that the reaction shall take place uninterruptedly, sulphate of iron must be employed, and then the action goes on exactly as specified above. The ferrocyanide of potash produced by the silver out of the ferricyanide gives, with the sulphate of iron that is added, a beautiful blue precipitate of Prussian blue, from which the negative becomes tinted of a dark blue.

It is another matter when the negative is treated with a mixed solution of chloride of iron and red ferricyanide of potassium. The negative still assumes a blue colour, although of a lighter character; but this blue does not proceed from the formation of ferrocyanide of potassium, this not being produced, as the exchange-action between chloride of iron and silver goes on with greater ease than does that of the latter substance with the red ferricyanide of potassium; and the formation of subchloride of iron (together with chloride of silver) in combination with the red ferricyanide of potash is, therefore, the reason for the appearance of Turnbull's blue.

The assumption of Grüne that silver negatives are not tinted blue with this solution is, according to our experiments, fallacious; Grüne has stated that it is only platinum negatives that become blue, not ordinary ones, and this is an error.

It is quite true, however, that a platinum picture also rapidly becomes blue in a mixture of chloride of iron and ferricyanide of potassium; we have also proved that this even takes place after the complete transformation of all the silver. We treated a negative with chloride of platinum, and then dissolved the chloride of silver that had been produced; on repeating the process three times in order to remove all the silver, the platinum picture still gave a blue colour very rapidly.

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* *Photographische Correspondenz.*

When the lead and uranium intensifying process is conducted according to chemical laws, as I have shown, it is clear that it cannot be continued beyond a certain degree; nevertheless, the silver is capable of precipitating a great deal of ferrocyanide of uranium and lead.

Two atoms of silver precipitate three atoms of lead, or uranium (as ferrocyanide); or, what is the same thing, two equivalents of silver throw down six equivalents of lead or uranium. If we bear in mind that four atoms of silver precipitate one atom of platinum (from chloride of platinum), and three atoms of silver also; but one of gold, and that one atom of silver is necessary, in order to form one molecule of insoluble subchloride of mercury from chloride of mercury, it is plain that the employment of ferricyanide of potassium, as an intensifier, is the most rational, as well from a theoretical as from a practical point of view.

FILM SPLITTING.

BY GUSTAV WEIL, OF MUNICH.*

How to avoid the lifting or splitting of a negative film is still an unsettled question, for often, in the case of plates which have been treated with the greatest care, the defect appears without any apparent cause. The matter has already been discussed from every stand-point, but the employment of various kinds of varnishes does not seem to prevent the recurrence of the evil. It is now generally accepted that the brittleness of the varnish is the real cause, but this is fallacious.

For a long time past I have striven to get at the root of the matter, and came to the conclusion that every sort of varnish and lac was apt to produce splitting, if applied to a washed collodion film that has been dried, and is afterwards exposed to a sudden change of temperature. On the other hand, a collodion film which has not been washed with water in the last instance, from the surface of which, therefore, water has not evaporated, may be coated with the same varnish with impunity. Collodion shaken up with a certain amount of water and exposed to the vicissitudes of temperature, shows less disposition to split than normal collodion exposed under the same conditions. From this, it is to be inferred that the lac itself cannot be looked upon alone as the cause of deterioration in the negative, but rather the treatment of the collodion film; a film which has been washed with water, and allowed to dry, is more liable than another to lift or split, because it does not adhere any longer so firmly to the glass, the moisture contained in the collodion having a tendency to loosen it, and subsequently to produce the worm-like markings so familiar to us. If a fine soft brush dipped in alcohol is passed over such defects in good time, the film is not removed from the glass; the alcohol brush is, however, only a help for a time, for such plates soon show further signs of deterioration.

How is it, then, that so many opinions are given upon the merits of various descriptions of varnishes? Simply because time and place vary in many instances. Such negatives will hold the longest in which a medium has been employed between the glass and the collodion—as, for instance, albumen; those also which are printed in an unheated chamber, and do not go into the sun on any occasion, keep well. It may be true that some kinds of varnishes more than others have the effect of reducing the evil to a minimum, but none of them can altogether prevent it, so long, that is, as water is allowed to dry upon the collodion film. It is only when this does not happen, that any reliance can be placed upon the keeping qualities of a plate. I may, however, remark that rinsing the film with distilled water renders the film less brittle than washing it with ordinary spring water.

Water is the cause of our films splitting. As, however, it is almost impossible to do without the same in the negative process (for, on the one hand, it would be difficult to employ solutions in the developing and fixing operations, and on the other more difficult still to check the action of these at the proper time), we are compelled to use water in our work. The rinsing of the film finally with alcohol would be the best means of removing the water and increasing the adhesion of the collodion film to the plate, if there was no danger in most cases to float off the silver particles upon the surface which have just been formed by the intensifier, or dissolve among those under the surface. But alcohol alone would scarcely answer the purpose, even if it could be employed without such risk, as the application of water has a particular effect upon the collodion film. Before even the dipping of the plate into the silver bath, care is taken that, on being coated with collodion, the surface shall not altogether dry, so that the nitrate of silver may enter more completely into combination with the iodine particles; the water rushes back quickly and energetically, every atom of ether and alcohol remaining in the pores of the collodion. In this way a considerable swelling of the film is brought about, which, by the successive treatment, increases, so that the film stretches too much, and begins to detach itself in fragments during the last washing operation.

It resolves itself, therefore, into a question of finding a means which, on the one hand, reduces the energetic action of the alcohol, and, on the other, replaces the water, which on the last washing is to be driven away; or, in other words, to fill up the pores of the swollen collodion, so that on drying this is not influenced by the absorption of damp. A varnish, I find, will answer the purpose, and this poured over the wet film as soon as it has been properly washed. The film in this way is made to retain its toughness, and is shielded from any of the annoying phenomena known as lifting and splitting of the film. Plates so treated may be exposed to changes of temperature without undergoing the slightest change, while the appearance of the surface at once demonstrates the fact that the film is much more adherent to the glass. Pencil and needle may be employed without fear for retouching, and the varnish never becomes brittle.

As will be seen, there is very little alteration in the *modus operandi*, the varnish being simply applied to the plates in the manner indicated, and the superfluous liquid allowed to flow off. It will be interesting to learn of any experiments undertaken to test the keeping qualities of plates prepared in this manner.

HORSE CHESTNUTS—THEIR USE IN PHOTOGRAPHY.

BY PROFESSOR J. TOWLER.

It will startle some of our brethren in the photographic art when we inform them of the extent to which horse-chestnuts can be applied by them. Gather a sufficient quantity of this excellent fruit before the season of harvest is over, and lay in a stock to last until next autumn.

In order to prepare them for photographic purposes, proceed as follows:—

First, get rid of the outer covering, the chestnut-brown coloured covering of the kernel within, and rub or scrape off the next thin fibrous coating until you arrive at the cream-white solid mass beneath. It is most probable that these two operations will be eventually performed by means of machinery.

The second operation is to rasp or grate the prepared kernels, so as to disintegrate them into a rough moist powder or fibre. To every pound of this disintegrated mass add three pounds of water, and, after mixing or kneading this mixture thoroughly with the hands, set the dish aside in order that the materials may macerate for twenty-four hours.

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* *Photographische Correspondenz.*

Thirdly, filter the macerated materials through a fine gauze sieve, or through a large cambric pocket handkerchief. Squeeze out all the liquid you can by pressing on the cloth with the hands, and gently twisting the handkerchief. In this way you get a yellow milky solution and a compressed mass of insoluble matter.

The milky solution contains an insoluble substance, that produces the milkiness, and also the yellowness, and a mixture of several soluble ingredients. Set the milky solution aside for twenty-four hours, after which time you will find that the milk-coloured substance has settled to the bottom; but the supernatant liquid still retains a substance that gives the solution a yellowish-white colour. Decant the liquid part from the white mass at the bottom,

This white mass is next stirred up from the bottom, to which it adheres with great tenacity, and is ultimately mixed with clear water to the amount of a quart at a time, and then set aside to settle. After subsidence, the liquid portion again is decanted and thrown away. This operation is intended to wash the white substance, and it is repeated several times until the wash-water no longer tastes bitter, and there is no deposit on the top of the white mass of a dark-coloured slimy matter. Now drain off every drop of the water, and cut out the white substance and place it on sheets of blotting paper to dry in the sun. When dry, you have a quantity of pure, edible starch of excellent quality for all purposes to which starch can be applied.

I use this starch for mounting all my photographs, and occasionally make a pudding of it.

We will now return to the first liquid. This has a yellowish-white colour, and is quite opaque. After standing a couple of days most of the insoluble matter will subside, and the liquid may be decanted from it in a great measure, but not so easily as from the first deposit of starch, because it is much lighter than the latter. It contains a small portion of starch mixed with gluten and other insoluble substances. Separate as much of the liquid as possible by decantation, and then filter it two or three times through paper until it is quite clear and transparent. This liquid is a solution of vegetable albumen, gum, sugar, tannic acid, and probably of other substances. Preserve it in a stoppered bottle for use, labelled "Infusion of Chestnuts."

Of what use is it?

I will tell you forthwith.

Prepare your collodion plates just as I have already directed for the preparation of the coffee dry plate, but do not use the coffee solution. The following solution is better; at any rate, such is the opinion formed from the experiments already made with the chestnut solution, compounded as follows:—

Infusion of chestnuts ...	2 ounces
Loaf sugar	43 grains.

This mixture will not keep; therefore prepare it every time fresh when about to get ready a number of dry plates. The chestnut solution alone will keep, but when mixed with sugar is apt to ferment. The plates are coated with this solution for about a minute; the solution is then drained off, and the plates are set away to dry, either spontaneously or by artificial heat.

The length of exposure is like that of any other dry plate, some eight or ten times longer than that required by the wet plate. I use the iron developer, either the nitro-gelatine, or Colonel Barratti's cupro-ferric; it is very probable that any iron developer will do. To the developer add four or five drops of the bath solution before it is poured upon the plate; and be sure that the collodion film is thoroughly wet before you pour on the developer, for each dry-plate film is coated, as it were, with a thin layer of soluble varnish, which must be either dissolved off, or thoroughly permeated with water, before the developer can arrive at the impression beneath it. With this precaution the development soon commences, and may be continued until the darkest shades are quite opaque. The development is quite under control. The resulting negatives are very fine and entirely free from fogging. Let us call this process the "chestnut process."

I thought I would try how the process would work after the chestnuts were roasted brown, and then to make a decoction of the ground roasted chestnuts. The results were identical with those obtained from the cold infusion.

What do I do with the dry substance left in the pocket-handkerchief?

I have found no special use for it as yet. After washing in several waters, all the bitter taste is entirely removed, and in this condition it may be used as food, for making bread or puddings, either alone or with a little wheat flour. If left long in water—that is, three or four days—the mixture begins to ferment. From this circumstance it is but proper to infer that it might be used in the preparation of yeast for the fermentation of beer, wines, or bread. Further experiments are needed in this direction.

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NOTE ON ALKALINE DEVELOPMENT.

BY M. MARIA EDER AND CAPTAIN TOTH.*

Of late the subject of alkaline development has been very much under the attention of photographers, and there are to be found in the journals numerous essays upon alkaline pyrogallic acid development, although very few have appeared treating of alkaline iron development.

An English and a German journal have, however, mentioned the fact that moist silver negatives may be very well developed by means of an ammoniacal solution of sulphate of iron and citric acid. Sugar and tartaric acid also prevent the precipitation of sulphate of iron through ammonia, caustic potash, carbonate of soda, &c., and there is produced a clear alkaline solution of oxide of iron, which reduces with extraordinary energy. According to our experience tartaric acid is the most suitable for the purpose.

The tartaric acid is dissolved in a large excess of ammonia, potash lye, or soda solution, and of the solution as much is added as will redissolve the precipitate that has been formed. The almost colourless solution colours on exposure to air, by the absorption of oxygen, of a dark green, in a very rapid manner, and for this reason it is necessary that it should be applied at once.

The alkaline sub-oxide of iron solution is most energetic in admixture with potash, and less so when ammonia or carbonate of soda is present.

Chloride, and also bromide, of silver are in this solution very rapidly and completely reduced to metallic silver; the reduction of the iodide of silver is slower and more difficult.

We are just now prevented from continuing these experiments, and make public this note in case any of our colleagues may have time and inclination to pursue the investigation.

Exhibition of Costumes at the Alexandra Palace.—An exhibition of a very novel and interesting character, which may interest photographers, will be held at the Alexandra Palace, under distinguished patronage, immediately after Easter. Prizes of considerable value will be awarded by the Alexandra Palace Company, and a committee appointed to carry out the Exhibition, for the best designs in ladies' costumes, the decisions being based on the originality, elegance, and economy of the dresses displayed. Several hundred varieties, including morning, evening, ball, and bridal costumes, &c., will be included in this competitive exhibition, and valuable opportunities of comparison will thus be afforded to costumiers and others, whereby it may be hoped that greater economy and elegance in dress may be attained than is afforded by the extravagent eccentricities which too frequently characterise the fashions of the present day.

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* *Photographische Correspondenz.*

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THE CARBON PROCESS IN FRANCE.

In France, as well as in England, a general and augmented interest in carbon printing has of late been spreading amongst photographers, and a recent event will tend to give increased impetus to the movement. We learn from trustworthy authority that the legal process commenced in France by Mr. J. R. Johnson against Messrs. Lambert and Liebert, for infringement of his patent for double transfer, has been arranged in an amicable spirit. The case, which had been wearisomely protracted, was some short time ago argued before the Tribunal of Commerce, and technical questions had been referred by the judge to a committee of experts, whose decision was awaited by the photographers of the Continent with much interest. At this stage, reconsideration of the matter, with a view to an amicable settlement, was suggested. and the mediature of Mr. W. S. Bird, of the Autotype Company, was accepted by the litigants, with a view of arriving at some honourable compromise. Mr. Johnson stipulated that an acknowledgment of the chromotype as subject and subsidiary to his patent of double transfer must be conceded at starting. The discovery upon which this patent was based was beyond question solely due to Mr. Johnson, and without this recognition he would press for a legal decision, admitting, at the same time, that the additions made to the original chromotype patent were of real value, and recognizing the ingenious practical improvements in the carbon process effected by M. Lambert. After considerable discussion, terms of agreement were achieved. The settlement was facilitated by the fact that many months ago M. Liebert, on becoming aware of Mr. Johnson's position, had made proposals to him which, at the time, were thought inadequate, and, personal questions becoming complicated with the case, the lawsuit issued which is now happily terminated. We say happily because, apart from the discomfort and disadvantage to individuals arising out of such litigation, the practice of carbon printing in France has been much retarded pending the issue of this dispute; but now, we understand, licenses will be issued for the united processes of Autotype and Lambertype in all the countries where Mr. Johnson holds patent rights.

Holding, as we do, that the public interest is often served by the enterprise of patentees giving impetus to progress in desirable directions, in a degree which could never be secured without the motive which exclusive rights alone can give, we congratulate Continental photographers on this issue, as giving renewed promise of advancement in permanent printing. We also congratulate Mr. Johnson on the prospect that opens to him of reaping at length the reward of his inventions, and the protracted labour and experiment of which they are issue. And as M. Lambert's modification of double transfer has added commercial value to the carbon process, the union, rather than the collision, of interests was manifestly a fair and natural issue.

We may add here that it is rumoured that measures are being taken in Paris for the formation of a joint-stock company to work the patents connected with carbon printing, and to develop the trade in relation with the photographic profession and fine arts. It is said the Autotype Company are invited to have "a finger in this pie," that a manufactory similar to the one at Ealing Dene will be erected, and handsome offices taken on the Boulevards. As at this very moment M. Braun, of Dornach, is arranging to convert his concern into a limited company, with a capital of £26,000, some attempt will probably be made to unite all the patents and all the talents.

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SCREENS FOR CONTROLLING LIGHT.

We have more than once recently called the attention of our readers to the value of screens as aids in controlling the direction of light in the studio. Light and shade, it is unnecessary to remark, are the chief elements of pictorial effect in every monochrome, and the due distribution and gradation are as important in securing accurate and pleasant portraiture as in producing satisfactory pictures. In a thoroughly well and judiciously lighted studio, with proper arrangement of blinds, screens are useful chiefly for producing variety of effect; but in the majority of studios, limited in lighting facilities by the exigencies of the position, screens are of vital importance. In the interesting communication of our esteemed Belgian correspondent, Mr. Charles Waldack, he calls attention to the fact that a French photographer alive to the importance of due control over the light, and to the aid which handscreens afford in securing such control, has just announced the issue of a pamphlet on a new method of lighting, to be supplied to subscribers at one hundred francs, equivalent to £4 sterling. The contents of this pamphlet, as we learn from Mr. Waldack, resemble the details given by Mr. Myers before the American photographers at the Chicago meeting of the National Association. Those of our readers who have our eighteenth volume will find full details on pages 381 and 389; and on page 367 they will find details of the screen recommended by Mr. Myers, together with some hints on the general subject. For the benefit of present readers who have not the back volume, we reproduce a description of Carl Myers' screen with instructions for its use. To young portraitists unfamiliar with the use of screens, we need only suggest that they serve the double purpose of supplying reflected light on the model wherever the artist may require them, and of subduing the force of light on the top of glossy heads, shirt fronts, and light draperies, and, when skilfully used, of throwing a shadow on part of the subject or background at will. Here are Carl Myers' description of his screen and instructions for its use:

> It is conceded that the use of the common hand screen, in a variety of forms, is the best possible method of controlling the light on the object, permitting, as it does, the placing of the sitter near the middle of the strongest light, and thereby shortening the exposure without producing harsh effects. This *principle* of the screen itself has been long known and used, and is not patentable, but new apparatus for supporting or wielding it is, and the apparatus we would call your attention to is the simplest, cheapest, most convenient, and effective yet invented for supporting a screen or reflector in any possibly required position.
>
> It is made of three walnut sticks, each four feet long. Two of these cross each other to stretch the screen, which is simply fastened by four tacks. The third stick has a metal handle at one end, while the other end is loosely screwed to the crossing of the screen stretcher. Near the handle the staff passes through a universal joint made spherical for symmetry. This completes the attachment. It weighs two and one-half pounds, and when shipped it packs into a

bundle four feet long, averaging about one inch thick, and so can be sent cheaply and without fear of breakage.

When used, a socket in the sphere fits over the top of any head-rest shaft as a support for the whole. As a preferable support we make a base of metal with column of wood, and shaft of hard wood or gas pipe, adjustible high or low; thus lightening and cheapening it, and making it very difficult to upset, as the weight nearly all lies in the base.

The apparatus is wielded by the metal handle, and the peculiar universal joint permits complete revolutions of the screen in any plane. The screen also revolves upon the end of the staff, and the staff itself twists in the joint, thus allowing the screen to be placed in any position as freely as if supported by the hand alone. The metal handle serves as a perfect counterpoise, and the slight friction of the parts retains it fixed in any position when the hand lets go.

It can instantly be raised or lowered in the column to suit standing or sitting pictures, without carrying it bodily from right to left. It has no machinery about it, no dangling weights, pulleys or cords to catch. As a reflector alone it is unequalled, and when inverted forms a concave reflector by the sagging of the cloth, whereby light may be concentrated upon any spot alone.

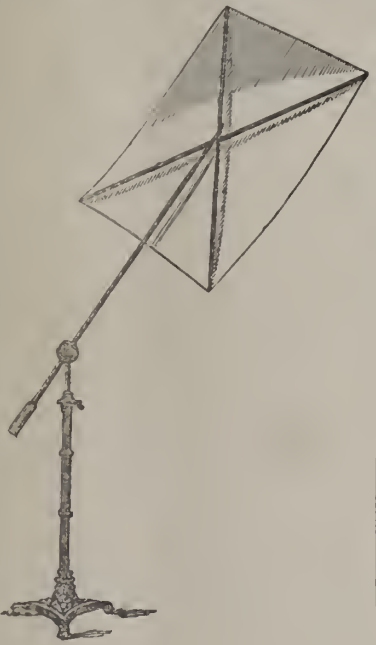
When used both as screen and reflector, *it will correct all the faults of a defective skylight except leaking*, and by it finer effects of light can be got more conveniently than is possible in any other way.

Directions for Use.—Cross the two light sticks for a screen-stretcher, and at their junction screw the end of the weighted staff. The spherical joint slips over the top of the upright rod of any ordinary head-rest, and screws down, but not so tight as to prevent moving easily.

A square yard of cloth may then be attached by four tacks in the ends of the screen-stretcher.

Next adjust the weighted staff so as to exactly balance in the spherical joint, and the screen will then be found movable to *any* required position, always perfectly poised, and remaining firmly fixed when the handle is released. The screws may be tightened if the apparatus moves too easily.

The attachment is wielded by the weighted handle, the intention being to control the light by reflecting it on the subject, or screening it from too direct light, and any desired effect is instantly attainable.



If the apparatus is used solely as a reflector it will save space if the screen-stretcher is attached about fourteen inches from the end of the staff, and the screen itself is loosely stretched so that when the frame work is presented to the sitter the screen sags into a concave reflector, to concentrate light on any one point when desirable.

As the result of several years' experience with the screen we advise the use of paper cambric as not requiring any hem, and cheap enough to throw away when soiled. White softens the light, but does not control it, and is recommended only when it is required to flatten the effect in whole length figures. Coloured screens, pink or pale yellow, or any non-actinic shade approximating to the colour of freckles, tan or scars, are influential in lessening retouching on negatives, as the face is lighted all one colour. For a semi-opaque screen, or for a reflector, this will be found more generally useful than any other.

For perfect control of the light by a screen we recommend the opaque or black screen when the head or face is the sole object. It is somewhat more difficult to control in the hands of inexperienced or inartistic operators, but the effects are more brilliant, and the requisite softness is obtainable by moving the screen farther from the subject and out of the camera's view. As a screen over the camera itself it confers all the advantages of the theoretically perfect tunnel light, with none of its defects, thus lighting the subject properly, and shading the camera.

Correspondence.

PRICE OF NITRATE OF SILVER.

Dear Sir,—In reply to the very natural inquiry raised by two correspondents in your last issue, we—as the largest manufacturers of nitrate of silver in England—feel called upon to state this simple fact, that when, twenty-eight years ago, we established the price of that nitrate at the rate at which it has until recently remained, silver was only about seven per cent. dearer than it now is, and that as the reduction recently made by us on nitrate of silver is five per cent., a margin of only a fraction of a penny per ounce remains to cover the present greatly increased cost of production, and the certainty of the market fluctuating against us. Your correspondent may feel assured that with keen competition on the spot, and a free customs' tariff, no undue profit can in these days be secured by any manufacturer.

We have no wish needlessly to fill your columns; but you may think it fair to allow us to add that probably no article has yielded to the manufacturers so miserable a return for their outlay, for at least twenty-three out of the twenty-eight years above mentioned, as nitrate of silver. It must also be remembered that with a product of this nature, a single accident, such as the breakage of a jar or dish, a bad debt, or a loss by speculation, may absorb the whole of the profit upon a long series of transactions.

The capital locked up in the manufacture of this one article, necessitated by the large provision of silver in advance, and the stocks of the manufactured product, which must be kept always on hand, averages from £14,000 to £15,000, and at times, over the many years from 1852 to 1872 (during the great Eastern demand for silver, and consequent rise in price), we did not make a net profit of even one per cent., with occasionally an actual loss. During this trying period some of your correspondents were considerate enough to suggest that the prices should be raised, and we, knowing how such a step (viz., establishing a fluctuating price for nitrate of silver) would disorganize the business, and trusting to the equitable system of averages in the long run, never did so.

The love of fair play, which we should hope characterises photographers, as well as every other body of Englishmen, will, we believe, not be wanting, if, in accordance with the wish expressed by your correspondent, a "controversy" is raised in this matter. For our part, we shall not think it right again to encroach on your valuable space.—We are, dear sir, yours faithfully, Johnson, Matthey and Co.

FADING OF SILVER PRINTS.

Dear Sir,—An old photographer told me within the last week, that the probable cause is to be found in the use of bullock's blood for the purpose of albumenizing the paper, instead of proper egg albumen. He told me that the traveller of a large house had assured him of the impossibility, considering the enormous competition, of supplying paper prepared with egg albumen, and that it was necessary to have recourse to that from blood. Is there anything in it?—Yours faithfully,

Thos. Parkyns.

[The allegation that the use of blood albumen contributes to instability in silver prints has often been made. We see no reason whatever for supposing that it is in any degree a cause of fading. There are reasons, indeed, why it should have directly the contrary effect.—Ed.]

CARBONATE OF AMMONIA IN THE FIXING BATH.

Dear Sir,—I do not think that a letter (from AgO, NO_5) in your last, in which the use of carbonate of ammonia in the fixing bath is credited with being, perhaps, the cause of the fading of photographs, should be allowed to pass without remark. The reasons, such as they are, given for this presumed result are totally unintelligible to me.

As a matter of fact, I have used carbonate of ammonia almost since it was first proposed by Mr. Spiller, and can appeal to my own experience that it is certainly not a cause of fading. From the nature of my business (viz., the supply of local views), I often get stocks of unsaleable prints, and as these are constantly coming under my eye, any symptoms of fading would be sure to attract immediate notice. Is it not the fact that most of the faded photographs come from abroad, or from cheap, minor, and country studios—about the last places where one would expect improvements which cost ever so little trouble or money, and which produce no very obvious results, tobe introduced. And what sort of treatment the prints sometimes get has now and then been revealed by correspondents, including the one whose letter is the cause of this.

From all I hear, I do not think that the use of carbonate of ammonia can be at all general; and I have never met with the slightest evidence of any injurious effect from its use. On the other hand, I must acknowledge that neither can I say that my photographs are more permanent than formerly. It is the clear proof that has been given that the whites of prints are more free from silver when it is used, that induces me to continue it. A rather lame conclusion, perhaps, but the probabilities are in its favour, and it would be matter of regret if what, notwithstanding my own negative evidence, I still look on as a step in advance, should be retraced because somebody who uses it finds his prints fade.

I do get impatient sometimes when reading so much about the fading of silver prints. As you know, I have practised the art for a long time, having assisted at the birth of commercial photography, and I say that silver prints, fairly treated, do not fade. True, some of the early examples scarcely bear me out in this, but they should be looked on rather as experiments. Since, however, the proper conditions of working have been better understood, I believe that every case of fading is a case of economy, ignorance, or carelessness—occasionally of accident.—Yours truly, RUSSELL SEDGFIELD.

Norbiton, March 12th.

URANIUM IN THE NEGATIVE BATH.

SIR,—May I suggest that those who are trying nitrate of uranium in the negative bath should, if they use extra bromide in the collodion, not omit to give a longer immersion to the plate? The bromide forms more slowly than iodide, and unconverted bromide remaining in the film is an element of insensitiveness.

I am heartily glad to see a process that I find to be of such value meeting with honest and careful experiment at the hands of capable men. If it would assist them to form an opinion, I should be very glad to send them a little of the collodion I find most suitable for use with the uranium bath.—Yours, &c. H. STUART WORTLEY.

DR. STEIN ON SPIRIT PHOTOGRAPHS.

SIR,—As a reader of the PHOTOGRAPHIC NEWS, and one interested in the phenomena called "spirit photography," I beg to offer a few remarks on the article of last week headed as above, and on spirit photography generally. It will be evident to those who have carefully read the article in question that Dr. Stein hardly goes into the subject of photographing "spirits" at all, but merely shows how he practised deception on several persons, not photographers. To the casual reader, Dr. Stein's performance may appear clever, but to me his attempts seem clumsy and unworthy of notice. Let him make any number of counterfeit sovereigns he pleases, and by as many processes, but will they prove that the ones issued from the Mint are other than gold? Thus his manufacture of sham "spirits" is no argument against the existence of real ones. As I intend only to describe my experience with M. Buguet, I will not discuss the theory or go into the question of the sensitive plate being able to receive upon it any object invisible to the human eye. A recent paragraph in one of the medical journals gave some interesting facts fully illustrating this power of the camera. Neither can I argue whether Buguet be genuine or not, or partly so; but if Dr. Stein could detect imposture, or would undertake to produce results equal, under the same conditions to those I am about to describe, his experience would be valuable.

I was accompanied by a friend (whose name I am not at liberty to mention), and when in the studio, selected, from a number of plates, one which, to identify it, I broke off the corner, and cleaned with nitric acid and alcohol. Buguet coated it with collodion, and placed it in the bath, a porcelain one, which I had previously placed in the full light of the dark-room window, which was large, and emitted much light rendering each object quite visible, the plate being ready, I drew it from the bath, and placed it in the slide, which I myself carried to the camera; still retaining the slide, I unscrewed the lens, and gave the camera a thorough examination in the expectation of finding transparencies, &c. Having replaced the lens, and focussed the chair, I put on the cap, and pulled up the shutter of the dark slide. I then seated myself, and Buguet prepared to uncap the lens: he was in the act of doing so, when I sprang up, captured the slide, and made off with it to the dark room, where I quickly reversed the plate.

This test is conclusive, for had there been any image previously placed on the plate, it would have appeared in the development standing on its head. My friend having watched the camera during the rapid visit to the dark room, the exposure was made, Buguet simply uncapping and capping the lens. I descended to his den, carrying the dark slide, which I opened, handing him the plate to develop; on taking it he instantly poured over it the developer (set ready), and the "spirit" and sitter came up gradually, the bright lights of both coming up simultaneously. The plate, previous to development, being in his possession hardly a second, and his not having moved from the light of the window, precludes the possibility of his "rapidly printing the latent spirit photograph upon the glass by means of artificial light" after the exposure, and the unexpected reversing of the plate before the exposure renders deception impossible. It is unnecessary, though I myself was perfectly satisfied, to enter into the question as to the recognition of the majority of the many "spirits" that came from Buguet's studio, as I have only to remind you of the large number (including photographers and influential persons) who came forward at his trial, and the rude treatment they mostly received. Finally, I would ask are such experiments as those of Dr. Stein of any use or value? Let any one who is interested in, or is investigating the subject, place them beside the results of the experiments of Mr. Beattie, of Clifton, who has at least proved that "spirit photography" is neither due to fraud, stains, nor self-deception. I could give other experience and quote many well attested instances of such photography, had I not already occupied so much of your valuable space; but I trust I have said enough to show that investigation, and not imitation, constitutes FAIRPLAY.

Christchurch, Hants, March 8.

DEAR SIR,—Allow me to call your attention to that portion of the brief account you have given in your number of the 13th inst. of Dr. Stein's lecture on Photography with Spiritualistic Bearings, which relates to the statement that he used a *negative* to produce a ghost of a young lady by the side of the medium. Every one acquainted with photography must know that a print from such an impression would be negress-like, because the relative light and shade would be inverted. Transparent positives are more suitable for the purpose of making blurred and diffused images by superposition.*

Modern spiritualists claim for themselves the power of giving scientific physical demonstration to substantiate their assertions. This is what we are waiting for, because the higher, or more scientific branches of photography, give them every opportunity to do so. It would be well, therefore, for all those who from motives of loyalty to truth feel compelled to take the opposition side, to make their statements in such a way as to be free as possible from mistakes, however trifling on their part, or misconstruction on the part of others.

Whilst writing upon this topic, I would take the opportunity of stating, as a matter of fact in my own experience, and at the same time of appealing to the knowledge of men of experience, whether they have not on many occasions been plagued by the formation on their plates of blurred and unlooked-for images, in ways at once so curious and extraordinary that if they had not been perfectly sure that in their art there was a physical cause for every physical effect, these coincidences would have remained for ever a mystery, and, if of the temper of modern spiritualists, would have deceived themselves into the belief that some elfish trick had been played upon them, instead of patiently analysing and reasoning out the cause of the phenomenon. If a really scientific photographer were so far to debase himsels as knowingly to deceive others, there are so many ways open to him in the varied processes which he could use without fear of detection for the manufacture of ghostly photographs, that, taking all things into consideration, any amount of testimony of persons of the highest attainments and unsullied character, however numerous, is anything but what should be demanded. A sequential arrangement of cause and effect to the final effect, each in itself demonstrable, is the only guarantee of genuineness; anything short of this, and we are not sure that we may not have fallen upon the cave of Scylla or into the whirlpool of Charybdis, for if it is necessary that a man should be wise before he can make a fool of himself, so it is that deceptions are comparatively harmless, until men of intelligence and honest purpose deceive themselves.

A few years ago, I invented a photographic apparatus by which a collodion negative or positive is produced in the open ground without tent or tent-box. Once the plate is collodionized and put into the dark slide, it does not return again into the hands of the operator until the image is developed and the sensitiveness of the film destroyed. Although with this, or apparatus of similar description, deception is not impossible, the modes of doing so are limited in number and kind, and could be pretty accurately expressed beforehand, and so guarded against. If some such apparatus were used in open ground in open day with experts to defend the interests of both parties, the dispute would end in a satisfactory decision at least to one party, and, I fear me, not our party, but the spirits. They will pity and despise our poor materialistic and mechanical plans, and tell us that they make photographs in colours without photography; and their followers will ask us, can you do that? and where are we?—Yours truly, Thomas Sims.

Calverley Park Villas, Tunbridge Wells, March 4th.

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SYPHON OR NO SYPHON.

Sir,—In your impression of March 3rd, "Peter Simple" remarks that I only allude to sensitizing baths. Just so; but I now allude to negative baths as well, in almost the same manner. My bath is 12 by 10 inches. I always keep two bottles, one ready to pour bath into, another to filter into, and I simply take my bath in my hands, and empty into bottle through funnel as described before, and then filter through paper into the other bottle. I have my second bath solution always ready in a Winchester, and after washing out bath, I am ready for work. Before filtering as above, I strengthen as required, and I never lose a drop. If by chance I have to use a bath without a lip, I make one in the following manner: I get a piece of bees-wax, warm it, make it the shape of a lip, and fix it to the bath, which answers so well, it is almost impossible to lose a drop; those who may have baths without lips, try it, and if you do not find it correct, blame me, and charge me for all you lose. My belief is, so many formulas going through is the just cause of so many complaints we hear of with our baths; from one bottle filtered through properly into another there can be nothing to contaminate the liquid or solution.

While writing I beg to call attention to Blisters, Syphons, signed, "F. W. Hart." Touching on the subject he says, as the letter is without name or address, he fails to see any guarantee to the photographer. I would ask Mr. H., or anyone else who would make such remarks, if it is likely the Editor would put anything in print, if he had not the name of the person so contributing? It so happens that I do not sign my name or address, but have sent it to the Editor. I should have refrained from making any remarks, had it been from any person otherwise than a manufacturer.—Yours respectfully, E. L.

Proceedings of Societies.

Photographic Society of Great Britain.

The usual monthly meeting was held in the Water Colour Gallery, 5, Pall Mall, on the evening of Tuesday, March 14th, Mr. J. Glaisher, F.R.S., in the chair. The minutes of a previous meeting having been read and confirmed,

The Chairman intimated to the members that the next meeting would be held on the first Tuesday in April, instead of the usual second Tuesday.

Col. Stuart Wortley having been called on by the President, in accordance with the decision of the last meeting, proceeded to open the discussion on "Emulsions." He said: "As regards the sensitiveness of the emulsion, though density appears to be acquired at once, and not to be affected by leaving the emulsion longer to mature before use; to obtain a certain degree of sensitiveness, the following time was required by the various bromides, as under:—

Manganese	...	7½ hours	Cinchonine	...	15 hours
Cadmium	...	9 "	Sodium ...	...	15¼ "
Strontium	...	10 "	Calcium ...	...	17 "
Magnesium	...	10 "	Ammonium	...	17½ "
Zinc ..	...	10½ "	Uranium ...	...	17½ "
Cerium ...	...	14 "	Barium ...	...	19 "
Potassium	...	14 "			

while bromine had not arrived at the same degree of sensitiveness in twenty-four hours. Temperature, moreover, exercised an important influence over the result, as in nearly every case I obtained the same result by keeping the emulsion at a constant heat of 70° in about half the time I should have required at a temperature of 40°. So far with regard to working the emulsion; now with regard to making it. Having been requested by the President to open the discussion on Mr. Warnerke's able paper, I offer the following remarks:—On the question of my proposal to make an organified pyroxyline, I am glad to find Mr. Warnerke's experiments lead him to think it will be of value to my co-workers. I learn that it is greatly valued by those who have tried it, and, with the exception of one or two failures through the use of nitrate of potash instead of nitric acid, no difficulty has been found in its manufacture. It is well to notice that the organic portion of the pyroxyline is largely soluble in water, and I have found that in boiling a sample of organic pyroxyline, the organic portion is rapidly parted with. The pyroxyline is very soluble in alcohol and ether, and twenty grains to the ounce dissolve with hardly any deposit. With regard to the formation of an emulsion, two points require special notice: one, the effect on the emulsion of the use of various haloid salts; and the other, the effect of temperature on the emulsion. I have tried the following bromide in emulsion, and find that a nearly identical result is obtained provided a sufficient length of time is allowed to elapse before using the emulsion, as the organic salts formed appear to be in great part washed away in the washing water; and if the water is used warm, a weak and thin film is sure to be the product. Hence the great advantage gained by adding gelatine, dissolved either in sulphuric or nitric acid, to the washed emulsion, as a rich, dense negative is thus produced without any difficulty, and with no loss of sensitiveness. I prefer this method of working to that of organifying the pellicle, as giving a far more certain and better result. You will notice I include bromide of cinchonine among those experimented with. This, having an organic base, is peculiarly suitable for use, and gave most excellent negatives. I have cut my remarks short, as I am sure there are others who will have plenty to say.".

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* It is quite possible that Dr. Stein may have used the word *cliché*, which would express either negative or positive according to the necessities of the case. We have not the original before us, and cannot say with certainty.—Ed.

Mr. Henry said that in his experience of emulsions, bromide of zinc gave the most rapid and satisfactory results. The formula he found most successful was as follows: to one ounce of collodion add nitrate of silver, 17 grains; bromide of zinc, 9¾ grains; aqua regia, 2 minims. At times there was a tendency to fog, and this was corrected by the addition of iodine.

Mr. Spiller suggested that it would be better to add to emulsions bromides associated wifh chlorides in definite proportions, instead of using aqua regia, and so giving rise to uncertain mixtures. In the emulsion just named there would be bromide of zinc, chloride of zinc, free acid, and free bromium—four distinct bodies. The definite addition of each required element would, he thought, lead to much more certain results.

Herr Warnerke said, in his case he had used aqua regia, not because he believed it to be the best and most scientific mode of preparing the emulsion, but because he wished to begin with a known and familiar preparation, and in the course of his experiments work upward to more exact preparations. Herr Warnerke then proceeded to read a paper on some further experiments, and exhibited some very curious and interesting illustrations of the results obtained. Several plates of glass were coated with emulsions and passed round to members, to illustrate the peculiar quality of dichroism they possessed.

Mr. Spiller asked how the bromide of ethyl used in the latter experiments was prepared, as it was an exceedingly difficult salt to obtain pure.

Herr Warnerke was not sure that it was so; but it was what he had purchased as that salt.

Mr. Spiller doubted, from the facts described, whether it were pure. He would have pleasure in supplying some undoubtedly pure to Mr. Warnerke.

Herr Warnerke would have much pleasure in repeating his experiments with it.

After some conversation,

Mr. Sebastian Davis called attention to a peculiar circumstance in some of the specimens passed round; he referred to the curious variation in the degree of sensitiveness of different emulsions to yellow or orange light. Emulsions sensitized with bromide of potassium, sodium, and ammonium, seemed nearly alike in sensitiveness to white light, but where they had been exposed under orange glass, the potassium emulsion was much more sensitive than the others.

After some further conversation a vote of thanks to Mr. Warnerke was passed by acclamation.

Captain Abney then read a paper on photographing the ultra red of the spectrum, and showed two examples in which a very extended spectrum had been obtained. He said he had found that the addition of some aniline dyes to the bromide emulsion extended the spectrum, but he had come to the conclusion that it was due to the combination of silver with the material of the dye, rather than to the colour. (This paper will appear in our next.)

Mr. S. Davis, referring to the addition in question, referred to the action of gum-guaicum to collodion. He had found that the addition of a grain or two to each ounce of bromo-iodized collodion made it more sensitive.

Mr. Dallmeyer referred to the communication which he some time ago brought before the Society from Dr. Van Monckhoven, in which he was unable to verify Dr. Vogel's results. It was probable that Captain Abney's experience would furnish a method of reconciling the discrepancies which appeared to exist in the results obtained by these two able Continental experimentalists.

In answer to Mr. Hughes, Captain Abney said he developed with as little light as possible; but the time of development being short, compared with the exposure, lessened the risk from coloured light.

A vote of thanks by acclamation having been passed,

Mr. Werge exhibited and explained Garrold's revolving circular dark slide. This is a flat, circular disc, holding five dry plates, which can be brought successively into position behind the lens, and rendered unnecessary double backs or changing boxes.

After a brief conversation, the meeting was adjourned until the 4th of April.

South London Photographic Society.

The usual monthly meeting of this Society was held in the rooms of the Society of Arts, on the evening of March 9th; the Rev. F. F. Statham, M.A., in the chair. The minutes of a former meeting having been read and confirmed,

Mr. W. T. Wilkinson read a paper on various matters connected with the successful production of negatives (see p. 121.)

The Chairman, in inviting discussion and proposing a vote of thanks, suggested to photographers generally the importance of keeping a note-book for the record of experience.

After some general conversation,

Mr. York said he had never been able to use silver solution for printing which had been employed as a negative bath; he had tried it, using citric acid to precipitate the iodide, but had found it useless.

Mr. Wilkinson said that if the solution were boiled down to the point at which crystallization would take place when the solution was cooled, the crystals would be found quite free from iodide, the whole of which would remain in the residual liquor.

Mr. Spencer confirmed Mr. Wilkinson's statement.

Mr. York's experience was opposed to that of Mr. Wilkinson. He had not found such crystals give a good printing bath.

Mr. Wilkinson suggested that possibly the necessary process of washing the crystals had been omitted.

Mr. Ashman had used baryta as a correction to the bath fo some years, and found it answer perfectly.

A conversation followed, in the course of which Mr. Wilkinson said the baryta answered ver well in a small way, but not on a large scale, on account of accumulated ether and alcohol, whilst Mr. York's experience was in its favour.

Mr. Brooks referred to the advantage of using a proto-nitrate o iron developer, with a bath containing nitrate of baryta, as it prevented the formation of a precipitate on the negative. He also described a form of alkaline bath which he sometimes used. He added carbonate of soda until a precipitate of carbonate of silver was formed, and then boiled the bath with the precipitate, then filtered, and added a trace of nitric acid, still, however, leaving a slight though decided alkaline reaction. Such a bath gave very rapid plates, and no fog; but it got acid with use, and required frequent fresh treatment.

After some conversation, in which reference was made to Mr. McLachlan's use of an alkaline bath,

Mr. Brooks, in answer to a question, said he made his nitrate of iron by the double decomposition process, sometimes using baryta and sometimes lead.

Mr. Spencer referred to Dr. Diamond's use of the proto-nitrate developer prepared in a similar manner, when he produced those charming collodion positives of matt white silver.

A conversation on the use of formic acid and methylal followed, in the course of which Herr Warnerke mentioned that Messrs. Hopkin and Williams were now supplying photographers with methylal prepared after the formula he had used—that of Mons Alexandre, published in our pages.

After a further desultory conversation,

Mr. Read said that when his bath was out of order he added a little tap-water, sunned, strengthened, and filtered, and always found the bath work well.

After some further conversation on precipitating iodide and removing impurities, Mr. York, in answer to a question, promised to bring some statistics to the next meeting as to the number of plates which could be rendered sensitive in a given quantity of silver solution.

More conversational discussion ensued, and the proceedings terminated.

West Riding of Yorkshire Photographic Society.

The ordinary monthly meeting of the above Society was held on Monday evening the 6th inst., at 7·30 p.m., at the Commercial Hotel, Bradford, the President in the chair.

The minutes of the preceding meeting having been read and received confirmation,

The Chairman introduced Mr. Tilley, of Stafford, to the meeting, who had attended for the purpose of demonstrating his method of producing combination negatives directly in the camera.

Mr. Tilley had brought with him a skeleton model studio, fitted up exactly after the manner of his own studio, with curtains and backgrounds, a doll representing the sitter, by the aid of which he gave a full description of his method of manipulating, going through each operation, as he explained it, in his model studio, demonstrating the extreme ease and simplicity with which the combined negative could be produced. He then handed round his dark slide, with its arrangement for placing the transparency in position, for the members' inspection.

A large number of prints from negatives produced in the manner shown were exhibited, including a number of enlarged transparencies, to which Mr. Tilley drew special attention as being a very important illustration of the advantages of his method, as by no other process extant can enlarged prints with natural backgrounds be produced without the use of masks, registration frames, or some other of the ordinary methods of combination printing. In enlarging from negatives produced as he described nothing of the kind is necessary, as no join of portrait to background can be perceived, and the background must necessarily be in keeping with the portrait, both as regards intensity and harmony of tone. He also showed how the operator had perfect control over the quality of the background, as it can be produced in or out of focus, and any degree of atmopheric effect can be obtained.

Mr. Tilley likewise demonstrated a second method of producing combination enlargements by the use of a hinged box, similar to an opal printing frame, with an extra front attached. By using a double plate, taking the portrait on one half, then drawing the curtain over the sitter, and exposing the other half, he obtains a mask of the sitter (both being taken with the light background). From the mask thus obtained he produces by contact printing a reverse mask, transparent in the background, and the shape of the portrait opaque. By then adjusting the portrait and mask in the hinged box or slide, he turns the mask away from the portrait and exposes for the portrait; then removing the portrait negative, he replaces it with a landscape, and, shutting the mask upon it, exposes for the background; the mask effectually blocking out the portrait, the result is a perfectly combined negative.

At the close of Mr. Tilley's remarks, one of the Secretaries (Mr. Crosthwaite) said that he had pleasure in testifying to the ease and rapidity with which the combined negatives were produced, as he had that afternoon had an opportunity of practically testing the invention with Mr. Tilley's model, by taking several combined negatives; and he was convinced that though it might appear somewhat complicated in type, yet in practice nothing could be easier, the combination negative being produced as quickly as most operators would produce an ordinary double-plate negative. The members generally expressed their entire satisfaction with the method, and on the motion of Mr. Sachs a most cordial vote of thanks was tendered to Mr. Tilley for giving the members an opportunity of seeing his valuable invention.

Mr. Sachs then laid on the table a number of photo-chromes, the production of M. Leon Vidal, which have been so enthusiastically described by the French Correspondent of the News.

Mr. Batho said the process was one very closely allied to chromo-lithography, and depended upon layers of different coloured tissues superposed one on the other. A negative was produced for each colour, in the same manner as a stone was required for each colour in lithography, a print produced from each, in the requisite coloured tissue, developed, and put together. He (Mr. Batho) considered that chromo-lithography would favourably compare and seriously compete with it. On inquiry from the members as to the price.

Mr. Sachs read the price list as forwarded to him. M. Vidal required an annual licensing fee of 500 francs, and undertook to produce the pictures for his licensees at the following rates:—6 cartes, 30 francs; 12, 40 francs; 24, 60 francs; Cabinet, 6 for 60 francs; 12 for 80 francs. Larger sizes proportionately.

Several gentlemen expressed their astonishment at the prices stated, taking into consideration the quality of the pictures, as there was a great lack of detail, particularly in the faces of the portraits, and they could not in any way compete with hand coloured work, which could be produced at a cheaper rate than the photo-chromes for small orders.

Mr. Sachs could not see the utility of the method of production, as there were so many different colours in the pictures; it was a serious undertaking to produce a cliché for every little coloured object that might appear in the picture.

Mr. Batho said it would not always be necessary to produce a separate cliché for each colour in chromo-lithography. The effect of a third colour was often produced by the overlapping of two other colours, and the same method was applicable to photochromes. It was also noticed that they failed very considerably in rendering the delicate flesh tones; indeed, the flesh was represented by almost a flat tint, with a little colour in the cheek, to which attention was drawn, that under a magnifier it presented the exact appearance of a brush stipple, or the texture of a grained lithographic stone.

One member considered that it would be very difficult to obtain negatives for the production of the greys in the face, as the negative possessed considerable opacity in those portions.

Mr. Cooke was of opinion that the leading thought of M. Vidal was to perfect a method of printing in colours by the aid of photography, without the aid of artistic skill in applying the colours, and in the published method such was the case, as what was required of the workman was merely mechanical ingenuity and skill. The process might be useful for price-lists and catalogues, but was not, in his estimation, capable of producing a portrait or work of art.

Mr. Wormald thought the picture was simply a gelatine transparency on a coloured foundation, produced by chromo-lithography.

The Chairman said, that as the process was as yet in its infancy, it was wise to withhold any very decided expression as to its merits, as it might in course of time grow to something of noble proportions. He scarcely thought the pictures were produced by the method announced, and was of opinion that the gentlemen who had praised the process could not have been sufficiently well informed on the subject, if the pictures before him were to be taken as fair specimens of the capabilities of the process.

On the motion of Mr. Wormald, a vote of thanks was presented to Mr. Sachs for his kindness in procuring the specimens, which he had done at considerable trouble and expense; and to Mr. Batho for his short descriptive outline of the process.

Mr. Sachs, in replying, said he was much disappointed with the pictures, as from the published statement he had expected something much better.

The meeting then adjourned.

Manchester Photographic Society.

The monthly meeting of this Society was held at the Memorial Hall, on Thursday, the 9th instant; Mr. W. T. Mabley, President, in the chair.

After the routine business, Mr. J. Pollitt read a paper on "Prolonged Exposures by the Wet Plate Process" (in our next), and handed round some negatives exhibiting the marks and defects alluded to in his paper; also a carrier for wet plates during long exposures, and some capital prints from negatives exposed from half-an-hour to two hours and three-quarters.

In reply to Mr. A. Brothers, Mr. Pollitt said the longest time he had kept a wet plate moist by putting wet blotting paper behind it was two hours and three-quarters.

Mr. Wade exhibited a number of large and excellent photographs of Californian and American scenery, by Mr. C. E. Watkins and Mr. J. A. Taylor, of California, kindly lent by Mr. Taylor, of Princess Street, Manchester.

The usual votes closed a very interesting meeting.

Talk in the Studio.

Photographic Studies.—We have received from Mr. W. Cobb, of Woolwich, a series of half-a-dozen cabinet photographs intended to express a moral. The series is called: "A Mother's Influence." A couple of children having discovered a bird's nest, are tempted to take it. Mother's influence is exercised in pointing out the cruelty, and inducing restoration of the nest to its place in the bush. The pictures are interesting, and the story well told.

Card Mounts.—We have been favoured by Messrs. Frewer and Evans with some examples of cards and printed designs of address, &c. The cards are of excellent quality, and many of the designs very ingenious and attractive. They are printed in black, in tints, or in bronze. Against the latter we must, in passing, express a word of warning, as it is a frequent source of spots. The photographic brown tint is very good.

Lecture on Commercial Dry Plates.—At a recent meeting of the Bedford Natural History Society two papers, one on "Micro-photography," and the other an original one, on the "Use of Commercial Dry Plates," were read by Captain Turton, R.N. They were illustrated by a considerable number of large and small photographs on glass and on paper, of the highest artistic merit, taken by Capt. Turton, who is an amateur photographer of wide and deserved repute. The travelling "pocket" camera, by which, and the use of dry plates, travellers can take photographs anywhere, leaving them for perhaps months, or even years, before development, were also shown. Capt. Turton expressed an earnest hope that some member of the Beds. Natural History Society would take up the subject, and promised to give every assistance in his power in the photographic part of the work. After a discussion, a hearty vote of thanks to Capt. Turton was moved by Mr. Goodall, who hoped that it would be possible to form a Photographic Club in Bedford.

Photographing Prisoners.—The conviction of a gang of criminals was recently aided by photography in Bedfordshire. On admission to gaol they resisted being photographed, and declined to give any information that would lead to their identity; but by a little scheming and trouble the Governor succeeded in photographing two of the prisoners, Joseph Durant and Arthur Rochley. These photographs were despatched to different parts of the country, and by the time the prisoners were brought up for re-examination, the following particulars were ascertained:—"Rochley, 24th June 1873, stealing from the person, three calender months. Durant, 1872, assaulting the police, 10s. costs, paid; 1873, larceny, six weeks; assault, one month; and drunk and disorderly fourteen days."

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To Correspondents.

An Old Subscriber.—We have no certain data upon which to base an opinion of the prospects of a photographic portraitist in any of the English Colonies you name. We occasionally see good photographs from the various places named, and hence infer the presence of good photographers; but whether promising openings exist for fresh talent we cannot say. In the principal towns of the Colonies you name you will doubtless be able to obtain all the ordinary chemicals required for general work.

W. W.—We have not seen any examples of Fargier's new carbon process; but we do not, for one moment, suppose it is likely in a hurry to supersede the process now in commercial use. You will learn from an article on another page that a company is just about to be formed in Paris, where the new process is better known, for the commercial working of the Autotype patents. We do not think you need hesitate for a moment to proceed with the process of which you have obtained the licence.

A. Vine.—The primary cause of the low tone of the picture and tint upon the whites is probably that the negative is not sufficiently intense. Possibly also it is a sample of tissue containing a small proportion of colour, and so giving a weak image. The use of a stronger bichromate bath would also probably help you. 2. Ordinary albumenized paper containing chloride is not a good material upon which to transfer a silver print on collodion. 3. We have published, both in the News and Year-Books, many times, good formulæ for developing collodion images for transfer. This will serve well: pyrogallic acid three grains, glacial acetic acid thirty minims, citric acid one grain, water one ounce.

Reflex.—There is no especial defect in the pictures due to reflected light. They are all faulty in lighting: many of them from the use of too much diffused front light, and the back one intense direct side light, a little in advance of the sitter. If you describe your studio and lighting arrangements, we shall perhaps be able to help you. The pictures are flat, dull, and ill-defined.

Anxious.—Something depends upon the weather. If you have a fine bright day and clear atmosphere, we should use the whole-plate lens; but if a misty or foggy day, the increased distance at which the lens of long focus must be placed would make it difficult to get brilliant pictures, in which case you had better try the quarter-plate.

A. B. C.—Your studio ought to yield you better results. The chief thing in its arrangement we should alter is the position of the rollers of the roof blinds. These should be placed at the ridge, not at the eaves; the object being to obtain a continuous side and top light. But the chief fault in the picture sent is due to too much light, especially in advance of the sitter. Draw the curtain over one side, nearly entirely, leaving a small space uncovered, well in advance of the sitter, and concentrate the other side from which the principal light is obtained. In short, concentration of light is generally the principal thing required.

Silver.—We have received no intimation as yet of the date of the Royal Cornwall Polytechnic Exhibition. It is usually held in September, and the announcements are not made quite so early in the year as the present. A line addressed to the secretary, at Falmouth, would doubtless obtain you the information.

F. H. Worsley Benison.—The work in question was never, we believe, published in this country. So far as we know, it was a little *brochure*, produced for the United States market, in conjunction with the stereoscopic slides of the author, which have a large sale there. The extract was made from one of our American contemporaries.

Amateur.—It is not difficult to acquire sufficient skill in photography to produce transparencies of engravings for the lantern. First of all, you must learn to produce a negative by the wet process. A small quarter-plate camera and lens, of cheap quality, will serve your purpose. Then write to us again.

Maggie Elsden.—The landscape No. 1 is about right in exposure A little more detail in the dark foliage at the left might possibly have been secured by pushing local development. No. 2 is in many respects very good. The light objects out of focus in the background slightly destroy the repose, and give the picture something of "spottiness," and the cushion of the chair requires considerably toning down, as it now competes much in prominence with the head of the child. No. 3 is also a pretty little picture. We should think you could secure an amateur's licence. Write and inquire. The detail in hair must be obtained by better illumination: no formula for developer will effect it. The card portrait is a little too dark, and there has been a slight movement in the sitter.

W. H. Hamoner.—In your question, "What is the essential difference in the construction of two lenses of (say) 5 and 10 inches focus, respectively, seeing that diameter has nothing to do with it?" you begin with a seriously erroneous assumption, as diameter, or aperture, which is of course much dependant upon diameter, has much to do with the working. The size of the picture is dependant upon the focus of the lens; the rapidity of a lens is dependant upon the diameter or aperture. The rapidity of a lens depends upon what is termed "angular aperture," that is, the relation of the effective diameter or aperture to the focus. In the construction of an ordinary portrait lens, the effective diameter, or full aperture of the lens, is generally about one-fourth of the focus, and of rapid portrait lenses one-third of the focus. The lens of 10 inches focus would, with the same diameter of aperture, be four times as slow as that of 5 inches focus. 2 "Depth of focus" may be obtained in various ways. It is obtained in the manner to which you refer, at the expense of rapidity by the use of a small stop; but if this attempt be carried too far, and the stop be too small, whilst depth or distribution of focus is obtained, there is a flat adhesive effect about the picture, and an absence of boldness and relief. Depth of focus may be obtained by a slight but judicious amount of under-correction in a lens; and, as in a patent portrait lens of special construction, by separation of the components of the back of the combination. 3. The relative position of the lenses in a combination is entirely dependant upon the form of the various lenses, and the especial combination of advantages sought. This is a point which can only be determined by the optician in the manufacture. 4. Of course there is great difference in the curves or figure, in different lenses. Each class of lenses has a different construction, different in curvature, different in general shape, different in the relation of the parts to each other, different in the density of the glass, different in size, position, and number of component parts. The optician's work consists practically in effecting a series of compromises, to gain an end practically opposed to theoretical perfection in optics mathematically considered. Depth of focus, flatness of field, distribution of focus, so as to secure good maginal definition, are, in fact, opposed to theoretical perfection in optics. The optician has a different aim in view in constructing every different form of lens. In a portrait lens, the two primary aims are rapidity and good definition; but in the construction best attaining these, flatness of field and good marginal definition are sacrificed. The image given by a portrait lens is well defined and well illuminated in the centre, but falls off to the margins. In a portrait lens for card portraits requiring standing figures the focus requires distributing, and a modification in the construction of the lens is made. In a single landscape lens distribution of focus over a larger surface is required, and less rapidity may serve: a large amount of spherical aberration is left which can be minimized by the use of a small stop, causing longer exposure. Such a lens would not be well suited for portraiture, nor is the portrait lens well suited for landscape. The single landscape lens gives barrel-shaped distortion; and to retain its good qualities, and get rid of its distortion, triplets, doublets, rectangular lenses, &c., are constructed. 5. To your question, "Is not a portrait lens of given focus equal to any other class of lens for depth, &c., if it be stopped down so as to possess same ratio of aperture to focus?" we answer, certainly not. This is a point upon which you may easily satisfy yourself by making the simplest form of experiment. Take a portrait lens of (say) ten inches equivalent focus, with half-inch stop, and a single lens of ten inches focus, same stop, and try a plate with each. The portrait lens will give you an image very sharp in the centre, but falling off in definition and illumination at the margins. The single lens will give you an image somewhat imperfect in definition all over, but with such definition and illumination well distributed all over. You may try experiments for various qualities with other lenses, but we have not space to enter into further detail here. A portrait lens best suited for its own work will certainly not do the work of other special lenses as they will do their own work; and a well selected stock of lenses, with, of course, knowledge to apply them, is of the utmost value to the photographer. It is perfectly true that photographers do not know nearly enough of the character, purposes, and proper use of various lenses. The subject is not easy to popularize; and requires some hard study to master it. But still there is plenty of information to be obtained by the really earnest student.

Several Correspondents in our next.

The Photographic News, March 24, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Reproduction of Paintings by Photography—The Action of Coloured Light upon Animals and Plants—A Photogaphic Tide-Recorder—Charlottype.

Reproduction of Paintings by Photography.—It is very clear that painters in this country will very soon have to make up their minds to have their pictures copied by photography. One of the most skilful of English photographers, the late Mr. Bingham, who excelled particularly in the reproduction of oil and water paintings by means of the camera, removed, of necessity, to Paris years ago, for the simple reason that his hands were tied in this country. In France for some years past a large traffic has been carried on in photographs of pictures, and the house of Goupil et Cie. alone produced hundreds of thousands of such prints annually. Yet no one has ever heard a complaint from our neighbours that this proceeding is detrimental to art or artists, but, on the contrary, many works which it would not pay to engrave have brought their author a goodly sum, as well as increased fame and reputation, from being copied by means of the camera. Last year we essayed in this country, for the first time, to reproduce some of the Royal Academy pictures in this way, taking our cue from the French, who have, it appears, just published their album of last year's Salon. This album was presented to the French Photographic Society at their last meeting by M. Rousselon, containing seventy reproductions in Photogravure of the leading works, both of painting and sculpture, that were exhibited in the French capital last year. Of this collection of photographs the *Athenæum*, we are glad to see, speaks in terms of high praise, and says that for the most part the pictures have been admirably reproduced. Our contemporary says, "The essentials in a transcript from a picture are that it should render the general keeping of the originals, the expressions, the characteristic treatment, and the draughtsmanship affected by the artist." It then goes on to state that "on these points, upon the whole, the copies leave little to be desired." One cannot help thinking, therefore, that the day is not far distant when photography will compete with the engraving method in this country for the vulgarization of works of art.

The Action of Coloured Light upon Animals and Plants.—Dr. Ponza's proposal to cure lunatics by exposing them to the effects of coloured lights, to which much attention has recently been directed, reminds one of the somewhat parallel trials that have been made with plants to which we have referred in these columns. Dr. Ponza, who is the director of the Lunatic Asylum at Alessandria, in Italy, tells us that by employing rooms glazed with glass of different colours he has been able to cure, or at any rate ameliorate, the condition of his patients. A room lighted with violet glass, for instance, and papered with paper of the same colour, was a cure for lunatics afflicted with melancholy; while a similar apartment painted red, and glazed with red glass, effectually improved the disposition of those maniacs who refused to touch food. Dr. Ponza advocates only occasional confinement in such rooms, and for periods of but a day or two's duration; and therefore it would be unfair to make any strict comparison of such experiments with seedlings and plants grown under coloured glass. At the same time it is well to bear in mind what is the result of cutting off white light from vegetation, as the same cause probably has a similar effect (in a very slight degree, perhaps) upon animals. According to the researches of M. Rudolf Weber on the subject, in no case are plants so healthy as when exposed to white light. Under green and violet glass, seedlings soon attain much longer stems than those under white glass, but the breadth of their leaves is small and narrow. Under blue glass the plants grow with long twisted stems, and dark green regular leaves; and this was the case, too, with vegetation under red glass. Next to the plants under white glass, those under yellow had the best developed leaves; but none of the plants were so heavy or so healthy under coloured glass as when exposed to white rays. This is a circumstance which deserves to be borne in mind.

A Photographic Tide-Recorder.—Photography has frequently been used for registering scientific and technical records, and is employed for such purposes every day at our observatories at Greenwich and Kew, and in other ways. It has been suggested for registering matters in connection with the human system, as, for instance, in furnishing a record of the action of the pulse and beating of the heart, and a proposal has actually been made for employing the pencil of light to indicate upon a chart the course of a vessel, so that at the end of a voyage one might be in possession of a log to show whether or not the most direct course has been steered by a vessel. The latest suggestion to use photography is in connection with the floods which have of late troubled our Continental neighbours to a serious extent, while the population and landowners in this country have been at times seriously inconvenienced by such irruptions of water. An apparatus is now suggested for marking, in the most accurate manner, the rise and fall of a river or tide, and this is to be done by permitting a bright beam of light to fall upon a running strip of sensitized paper. Without troubling our readers with any elaborate description of the mechanism, we may say that the apparatus is so contrived that the water in rising or falling has the effect of moving up and down, in proportion, a powerful Argand lamp, which is provided with a suitable reflector and lens, and thus sends forth a bright pencil of light; the latter, impinging upon a broad strip of paper, which is in motion, traces a black line, straight or wave-like, according whether the lamp is steady, or rises or falls. The apparatus is made to act for a certain period—a dozen or twenty-four hours—and at the end of this time the sensitive paper furnishes a precise record of the state of the tide or of the river during the period in question.

Charlottype.—Photographs, said to be produced by a peculiar process yclept Charlottype, have been lately attracting attention in Vienna, from the circumstance that the public are invited to believe that the pictures are produced in their natural colours. That this is not the case need scarcely be asserted, and it seems more than likely that the photographs in question are merely coloured with aniline dyes. It is said that a solution of aniline red, if applied to the face and hands of a portrait, gives a rosy tone which is retained on the toning and fixing of the photograph. Some ten years ago a process was started in Austria for colouring photographs chemically, of which a full description appeared in these columns; but it seems unlikely that Charlottype is any modification or improvement of this. According to the general opinion, the pictures in question have been coloured by hand, and the pigments subsequently fixed in some way.

FRENCH CORRESPONDENCE.

Vidal's Agenda Photographique—Fortier's New Manual on Photo-lithography—The Bitumen of Judea Process—Micro-photography and Carbon Printing in Spain—Nadar's Portrait Gallery.

The *Agenda Photographique* of M. Leon Vidal has at length appeared. In a short preface the author apologises for the delay which has attended the publication of the work, on the score that the idea occurred to him very late in the year. As the *Agenda* is to appear henceforth every year, M. Vidal promises that he will neglect nothing in future to make the work as complete as possible, and that he will not hesitate to profit by any suggestions and observations that may reach him from his readers. The volume is compiled in a manner altogether different to that of the

Annuaire previously brought out by M. Davanne, or of the Photographic Year-Book which is published in England. The theoretical part of photography is left altogether on one side, and the book is made up of general instructions about processes and methods so as to form a veritable directory, and thus it is made to fulfil a real want. The work is got up in a most luxurious manner, in good type, and with gilt binding.

A book of quite another stamp, but not less beautifully finished, has just been published by Gauthier Villars. Its title is, *La Photo-lithographie, son Origine, ses Procedes, ses Applications*, and the author is M. G. Fortier. The author has divided his work into three parts: the first is purely historical, and comprehends a retrospective account of all the photo-lithographic processes published; the second portion includes the various formulæ connected with photo-lithography; and the third part describes the processes in use by the author, of the results of which he gives several examples. M. Fortier operates by transfer upon lithographic stone, and farther upon zinc; he employs gelatined paper, sensitized by means of bichromate of potash. He exposes the sheet of paper under a cliché in an ordinary printing frame, and then develops the image in the manner following:—He attaches the print upon a little plank having a very smooth surface, by means of drawing-pins, and inks it by the aid of a roller of gelatine which is passed over the surface in such a manner as to cover it entirely with transfer ink. With a tuft of soft rag he removes any excess of ink that may attach to the surface, for it is necessary that the impression should be faintly visible under the film that covers it. The gelatined paper, exposed and inked, is plunged into a bath of cold water; the gelatine which has not been rendered insoluble by light swells up, and has a tendency to dissolve, and the print is left immersed for about a quarter of an hour in the bath. In winter it is well to pass the impression into a second bath containing water at about 30° C. The paper is withdrawn from the bath, and placed perfectly flat upon a stout glass plate. The removal of the ink is then aided by rubbing the print gently with a tuft of cotton wool, care being taken not to injure the black lines. The impression thus developed should present exactly the same appearance as if it were on stone. If it appears that the whole lacks vigour, or that the lines are, so to speak, rotten, the impression is passed between sheets of filter paper, and inked once more. The transfer to a lithographic stone must not be made until the impression is perfectly dry. The print is put upon the well-polished stone, and covered with thick sheets of bibulous paper, moistened all over very uniformly, so that the transfer becomes thoroughly moist throughout. The tympan and pads are lowered upon the impression; it is subjected to two gentle pressures in the press, and then the bibulous paper is removed, and the whole should leave the stone, with the exception of the tracing in ink which forms the picture. Immediately after having lifted the paper backing, the stone is carefully washed to remove any gelatine that may have remained upon it, and then first at the margin, and finally all over the impression, is passed a sponge impregnated with water, acidulated by means of nitric acid. The stone should remain in this condition for at least an hour or two, and then the pulling of prints may be commenced, the transfer henceforth being treated as a simple lithographic impression. In the manner of proceeding described by M. Fortier, whether in the photographic manipulations connected with the preparation of the gelatined paper and development of the image, or in the lithographic branch of the work, in the transfer to stone and pulling of prints, there is nothing new; but the descriptions he gives of the work are very clear and very precise, and we believe, therefore, that in following punctually his directions, it is possible, as he announces, to obtain very good results. As we have already said, he operates also upon zinc with bitumen of Judea, and he then treats the plate as a litho. stone, with certain modifications. He employs for the purpose a zinc plate perfectly polished and well planished, and upon this he spreads a varnish, composed of:—

Benzine, anhydrous	100 parts
Bitumen of Judea	3 ,,

The printing under a cliché, which should be reversed, is slow, especially in winter. To develop the image, the plate is plunged in a bath containing essence of turpentine; if the exposure under the cliché has been well timed, the impression appears immediately. As soon as it has appeared, it is washed under a rose of fresh water, and rapidly dried. The print, thus developed, and exposed for some time to light, assumes a greater degree of solidity, and may, indeed, be warmed slightly, an operation which has the effect of securing greater adherence of the film to the zinc plate. In this condition the zinc plate is treated with gum solution and acidified water, as in the case of the lithographic stone. The different specimens which illustrate M. Fortier's work, are, as we have said, very remarkable. It is true that the ambition of the author has gone no further than the reproduction of engravings, but he has succeeded very well in his work thus far. Moreover, he gives some specimens of chromo-lithography, printed in as many as eleven different colours, the same being printed by means of the zinc process, which he has described.

I have received from a correspondent in Spain a series of micro-photographic prints in carbon, which give a very good idea of the progress which photography in this direction has made on the other side of the Pyrenees. M. Truan, of Gijon, the author of the pictures, tells me that he has produced more than eighty clichés of this nature, and the manner in which the impressions are printed prove him to be a thorough adept in printing in permanent pigments. The animalculæ which compose his collection are, as a general rule, amplified to the dimension of 12·0 diameters, and the operations have been so well conducted that, despite their infinitely small size (there is among them the proboscis of a fly), every minute detail is apparent. An album made up of these interesting pictures will figure at the next exhibition of the French Photographic Society, to be held in Paris in May next.

A good deal has been said in artistic circles concerning certain portraits which have been produced in the studio of M. Nadar, and which represent the celebrities in literature, of the theatre, of politics, and of finance. They are enlargements upon painter's canvas produced from cartes-de-visite. A painter of considerable talent, whom M. Nadar has engaged for some time past, M. Emilio Vicusseux, transforms the photographic enlargements into magnificent paintings, sometimes in oil and sometimes in water colour, treating his subjects in a very masterly and original manner. M. Vicusseux's secret of success is that he produces a work of art, while retaining all the resemblance given by the camera. Ernest Lacan.

SILVER, CHROMIUM, CARBON.

(A Critico-chemical Comparison).

BY W. HOWARD, ANALYST.

Silver.

Prior to entering upon a more detailed consideration of our subject, it may be well to enumerate briefly the points in which a chemical comparison may be instituted between *silver* and *chromium*. They are as follow:—

a. The general chemical characteristics of the metal under consideration.

b. The nature and ultimate result of the decomposition effected by the agency of light on the metallic salts.

c. The degree of solubility of the salts used as sensitive agents.

d. The chemical character of the compounds formed by the action of light, particularly their relation to atmospheric impurities, &c.

It will be readily seen that this arrangement of our plan of inquiry will direct our attention to a consideration of the natural phenomena upon which the practice of photography is based, and thence, by a *logical* method, to a further consideration of the possible sources from which destruction may arise.

To *silver*, as being the best established basis of photographic work, I shall first direct your attention. Silver is a metal belonging to the same chemical group as copper and mercury. It does not decompose water under any circumstances; it is directly oxidized by nitric or strong sulphuric acid; it forms two basic oxides, which are by the aid of heat alone resolved into silver and oxygen.

These two oxides of silver may be thus represented:—

$$Ag_4O,$$

Argentous oxide, or silver suboxide.

$$Ag_2O,$$

Argentic oxide, or silver oxide.

They cannot be prepared by the direct action of ordinary oxygen upon the metal; hence, in ancient times, silver obtained the appellation of "noble" or oxygen-resisting metal. It is from the argentic oxide that the ordinary salts of the metal are formed

In addition to these oxides, modern research has discovered a third, which is marked by being formed by the direct action of oxygen; the oxide in question is—

$$Ag_2O_2,$$

Argentic peroxide, or silver peroxide.

Although this oxide is formed by the direct action of oxygen, it is in the first place necessary to procure a modified form of that element to produce this result. A few words of explanation will enable my non-chemical readers to form an idea of this oxygen modification. A molecule (that is to say, the greatest state of subdivision in which an element can exist in a *free* state), of ordinary oxygen consists of two atoms which we may represent as:—

$$O—O$$

This is termed a diatomic molecule; a triatomic molecule or O-O-O also exists naturally in small quantities; and by artificial means, such as the action of phosphorus on moist air, it may be readily procured for experimental purposes. This three-atom molecule of oxygen is named ozone, and is remarkable for its powerful oxidizing properties, being able to act immediately upon organic matter, and upon silver and mercury at ordinary temperatures.

This powerful agent, which is known to exist in the atmosphere, has hitherto had but little attention from photographers, although it is very probable that it is the prime agent in causing those decompositions of which the result is a faded picture.* Theoretical considerations point strongly to this conclusion, and, if time permits, I will, before the conclusion of this series of notes, make some experiments to ascertain the effects and probable action of ozone on photographic prints.

Though silver does not combine readily with oxygen under ordinary conditions, it has strong affinities for an element which, in many respects, resembles oxygen—viz., sulphur. Indeed, silver is naturally found in combination with sulphur, as—

$$Ag_2S.$$

Argentic sulphide (silver glance).

Upon passing sulphuretted hydrogen gas through a solution of any silver salt, the sulphide is precipitated as a black powder, and the oxygen acid is set free thus:—

$$\underset{\text{Silver nitrate.}}{2AgNO_3} + \underset{\text{Sulphuretted hydrogen.}}{H_2S} = \underset{\text{Silver sulphide.}}{Ag_2S} + \underset{\text{Nitric acid.}}{2HNO_3}$$

Or if we take the oxide of silver, and act upon it with sulphuretted hydrogen, the oxygen will be expelled; thus:—

$$\underset{\text{Silver oxide.}}{Ag_2O} + \underset{\text{Sulphuretted hydrogen.}}{H_2S} = \underset{\text{Silver sulphide.}}{Ag_2S} + \underset{\text{Water.}}{H_2O}$$

So strong, indeed, is the affinity of sulphur for silver, that at ordinary temperatures it deserts other bases to combine with it, forming the black stains to which our silver articles are so prone.

Indeed, the analogy of sulphur and oxygen in their relation to hydrogen and to the metals generally cannot escape our observation. The following table shows this similarity very plainly:—

Water	H_2O	Sulphuretted hydrogen	H_2S_2
Hydrogen di-oxide	H_2O_2	Hydrogen di-sulphide	H_2S_2
Carbon di-oxide ...	CO_2	Carbon di-sulphide ...	CS_2

By looking at the above table (for which I am indebted to Roscoe's admirable little book), we perceive that in the case of at least one non-metallic element (carbon) oxygen and sulphur form similar compounds.

I have been thus minute in particularizing the relation which silver bears to oxygen (ozone) and sulphur, because when we come to investigate the causes which lead to the *infallible* destruction of silver prints, we shall see that these agents (existing as atmospheric impurities, viz., sulphuretted hydrogen, sulphurous anhydride and ozone) play an important part in that much-to-be-avoided consummation.

Among the salts of silver which are of photographic utility, silver chloride (when printing is in question) holds the prominent position. This salt is formed in various ways, either by the direct action of chlorine on the metal at high temperature, or by decomposing another chloride by means of a soluble silver salt; thus:—

$$\underset{\text{Silver nitrate.}}{AgNO_3} + \underset{\text{Sodium chloride.}}{NaCl} = \underset{\text{Silver chloride.}}{AgCl} + \underset{\text{Sodium nitrate.}}{NaNO_3}$$

Chlorine in many respects bears a strong resemblance to oxygen. It combines greedily with metals to form chlorides, and this combination is, like that of oxygen, frequently attended with evolution of light and heat.

The chlorides, like their congeners the oxides, are decomposed by strong mineral acids, forming salts of identical composition; giving, however, instead of water (which is the secondary product of the decomposition of an oxide by a mineral acid) the gas, hydrochloric acid, HCl.

The affinity of chlorine for hydrogen is, like that of oxygen, very great; so much so, in fact, that it will support to a certain extent the combustion of a candle, appropriating the hydrogen to form hydrochloric acid, and setting the carbon free as soot or smoke.

Nitrate of silver is the salt of next importance to the photographer, as being the source from which he obtains the silver necessary to form his chloride. In the presence of organic matter, and under the action of light, this salt undergoes partial decomposition, and assists materially in forming the positive image. The reactions of that process will, perhaps, be most conveniently studied in section *c* of my subject.

Upon looking over the evidence which has been so far adduced, one fact becomes remarkably distinct—viz., the ease with which silver may be reduced to the metallic state. Its affinity for oxygen is so feeble that it cannot unite with it at any temperature, under ordinary conditions. Indeed, as I have stated, a moderate elevation of temperature is sufficient to split its oxides up into gas and metal; or we may pass a stream of hydrogen over them when heated, forming water and silver; thus:—

$$\underset{\text{Silver oxide.}}{Ag_2O} + \underset{\text{Hydrogen.}}{H_2} = \underset{\text{Silver.}}{2Ag} + \underset{\text{Water.}}{H_2O}$$

The chloride, it is true, cannot be decomposed even by intense heat alone; but if we take advantage of the affinity which chlorine has for hydrogen, we may effect the desired result; thus, by passing hydrogen over silver chloride at a red heat, we obtain silver and hydrochloric acid:—

$$\underset{\text{Silver chloride.}}{AgCl} + \underset{\text{Hydrogen.}}{H} = \underset{\text{Silver.}}{Ag} + \underset{\text{Hydrochloric acid.}}{HCl}$$

These characteristics of the metal and its compounds having been considered, we are in a position to review the action of light upon the silver salts and their organic modifications.

(To be Continued.)

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* M. Carey Lea holds this opinion, and has published experiments nfirming it.

PROLONGED EXPOSURES BY THE WET-PLATE PROCESS.

BY J. POLLITT.*

One of the weak points appertaining to the wet-plate process is the great difficulty, particularly during the hot months of July and August, of keeping the plate, and then developing it successfully, for any longer period than twenty or thirty minutes after taking it out of the nitrate bath. This drawback is, for several reasons which will presently appear, a much more serious one in the case of photographing a very dark interior, where an exposure in the camera of not less, and in some cases very much more, than an hour is required.

It will be within the recollection of many now present, that about two years ago some excellent prints were shown in this room, by Mr. Kershaw, of Buxton, printed from plates which, after being sensitized in the usual way, were carried several miles to make the exposure, and developed without a stain or mark of any kind three or four hours afterwards, the only expedient resorted to being the very simple one of keeping the slide buried inside a large wet towel.

I have myself found, in the case of taking a group, when there has been considerable delay after the plate has been sensitized in getting the individuals together, that by laying the slide face downwards upon the damp grass, and a damp cloth thrown over it, the plate will keep good for an incredibly long time, the obvious reason being that in a well-made slide, when placed in this position, the plate is almost hermetically sealed up. It is, however, when the plate is in a vertical position in the slide, with the whole open space of the interior of the camera in front of the film, thereby facilitating evaporation during an exposure of from thirty minutes to three hours, that its keeping qualities are put to the most crucial test.

It is true the rapid symmetrical and rectilinear lenses are in some cases great helps in getting out badly-lighted subjects with a considerable reduction in the exposure; but for general interior work I find that the wide-angle lenses must be used if anything like an adequate idea of proportion and size must be given, and that, of course, means a small aperture and long exposure.

The difficulties militating against the successful development of a plate which has had a very prolonged exposure may, I think, be reduced to the usual orthodox number of three, viz., uneven development, oyster shell markings, and the drying of the film. I need, however, say very little under the first head, because it is rather a question of skill in manipulation to run the developer at one sweep over a film to which it does by no means take kindly after a very long exposure in the camera. The other two divisions I shall treat in a general way rather than *seriatim*, because one is intimately associated with the other.

Various expedients have from time to time been resorted to and suggested to prevent the drying of the film during a long exposure, and to make the development more easy and successful afterwards. My own experience, however, tends to the conclusion that it is much more desirable to guard against complicity in manipulation, and endeavour to keep the film moist by other means than either glycerine or the redipping of the plate in the nitrate bath before development. I much regret that for want of time I have not been able to make many experiments, which I purposed doing before preparing this paper; but I have, at any rate, fully satisfied myself by repeated comparative trials, that the redipping of the plate in the nitrate bath before development very much injures the softness of the resulting negative, and makes what would be a fully-exposed plate without the redipping equal only in quality to one which has simply had half sufficient exposure.

I have also tried the application of a mixture of bath solution and glycerine in various proportions, both before and after exposure; and although I have obtained what I have considered at the time, in the absence of any other negative of the same subject to guide me, a good result, yet when I have afterwards, and for the sake of comparison, taken another negative without the glycerine, the result has been so infinitely superior as regards brilliancy and gradation of detail, that I have long since come to the conclusion that our hopes in this direction must be neither in glycerine nor the redipping of the plate after exposure; nor, in fact, in any chemical application to or treatment of the film after sensitising and before development.

With respect to the drying of the film, and oyster-shell markings: they are two distinct defects, and totally different in appearance, and yet the one may be said to be caused by the other, although they do not always both make their appearance on the same plate. I sometimes get drying-marks alone, as in the negative before you, in which you will see the haloid salts have crystallized in groups on one part of the plate, consequent on the drying of that particular part. This plate was sensitized and developed in an intensely hot tent on which the sun had been shining, and it was exposed in the camera on a very hot day for forty-five minutes; yet it is not a failure, for the defects coming in a shadow are not shown in the print.

Before proceeding further, it will, perhaps, be well to state here that a suitable collodion is of the first importance when a prolonged exposure is necessary. Naturally a porous or powdery collodion suggests itself as being the most likely to retain the moist condition in which it leaves the nitrate bath intact for the longest period; but it unfortunately happens that a collodion of this nature, although the very best for dry plates, is most unsuitable for wet ones by reason of its greater slowness, and the weak and flat images which it gives. I have succeeded best by mixing with a good normal collodion for wet plate work about one-third its bulk of powdery collodion. This, I find, gives me greater immunity from troubles with long exposures, and does not interfere sensibly with the good qualities of the original collodion.

When the plate has been in the bath long enough, it should be drawn up on the dipper very slowly. After draining over the bath for a few minutes, it should be fixed with the bottom edge on a pad of blotting-paper, and in this position allowed to drain for about five minutes before it is transferred to the dark slide. I also put a damp pad of cloth inside the camera, and a similar one on the back of the plate in the dark slide, and, after drawing out the shutter, I put a large wet towel over the back part of the camera.

With respect to the development: I do not advise a stronger solution of iron than twenty-five grains to the ounce, unless there are violent contrasts of light and shade, in which case it may be advantageous to increase the strength up to forty or fifty grains. Gelatine should on no account be used in the developer, as it sometimes causes the film, when under-exposed, to split up on drying.

For interior work—or, in fact, any other kind of work where long exposures are necessary—I think both the camera and dark slide ought to be specially constructed with a view to meet the difficulties of the case. I have used almost every variety and form of camera and camera slide, and I have found that, whilst some have given perfect freedom from defects of every kind under the most trying circumstances, and with the fewest precautionary measures, with others it has been absolutely impossible to get anything like successful results under similar circumstances.

It has been rightly said that in order to understand the nature of a chemical difficulty it is a good thing to learn to produce that difficulty.

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* Read before the Manchester Photographic Society.

Take one of the old French cameras, such as were in vogue in the early days of photography, and then chiefly used in the glass positive process, the dark slide unvarnished both inside and outside, the lower edge of the sensitive plate resting its whole length on the rebate, and no well to receive the drainings from the plate. Expose the plate in such a camera for any length of time exceeding fifteen or twenty minutes, and I can answer for it that however much image may be developed, there will be a famous crop of oyster-shell markings brought out simultaneously.

The cause of the drying marks—or, rather, spots, which they really are—is, as I have already intimated, the partial evaporation of the water from the film causing the haloid salts to collect together in groups and crystallize. But the oyster-shell marks, although resulting in part from the same cause, also result from another cause, viz., imperfect draining off the film of the superfluous nitrate solution, and they are invariably produced before the further stage of dryness is reached, when the silver salts begin to crystallize; that is to say, as the upper part of the film is gradually becoming dry, the solution is meanwhile draining towards the bottom edge, and although that edge may be resting on a pad of blotting-paper, it is not always thereby effectually removed from the plate. Even when it is effectually removed, if the pad become quite saturated, as the plate gradually becomes dryer it begins to creep up by capillary attraction in irregular lines for a certain distance on the lower part of the film. This, at any rate, is my theory of the cause of these vile markings, the real drying spots being invariably at the top of the plate, where drying will naturally commence; and the oyster-shell marks as certainly appear towards the bottom.

If this be the right view of the case, it follows that a great improvement may be made in the apparatus to be used; and for this special kind of work I see no reason why the body of the camera should not be made of japanned tin. The dark slide should also, in my opinion, be made much larger every way than is usual, so as to allow a carrier, which will facilitate the draining of the plate, and having a large recess underneath for blotting-paper. It should also have more room between the back and the shutter, so that a thick, damp pad can be put behind the plate to prevent drying, and, at the same time, an arrangement should be made to prevent the damp pad touching the blotting-paper at the bottom of the plate. There should also be a clear space of at least a quarter of an inch between the films and the shutter, so that there will be no danger of the former being pressed against the latter should the plate be slightly convex on that side.

I find that slides made of close-grained and well-seasoned Spanish mahogany, with the inside of the shutter French polished—not blacked—and the rebate coated with shellac, have given me the least trouble to keep the plate moist. Of course the inference from this is plain—that the less porous both camera and slide, the more effectually will evaporation be prevented during exposure.

I have here a carrier which I have had specially made to carry away the drainings from the film. You will see that the plate is supported on two very small bearings, and underneath is a space for blotting-paper. With this carrier I have had neither drying spots nor oyster-shell markings with an exposure of two hours and a-half. The old form of carrier does not carry out this idea sufficiently. There is certainly an approach to it, but there is sufficient bearing at each lower corner of the plate to collect a pool of silver solution as it drains from the plate, and it is not easy to carry it away by blotting paper.

The examples I have brought with me to-night are in many cases difficult subjects, and have had exposures varying from thirty to one hundred and sixty minutes They have not, however, been taken by a metallic camera, or any special form of dark slide; but I have met with so many difficulties in rather a large experience in this special kind of work, that I believe some such modifications in the construction of apparatus as I have indicated are not only greatly needed, but would be largely patronized.

A SIMPLE SUBSTITUTE FOR GROUND GLASS.

BY M. PREVEL.[*]

In making some experiments lately, I was led to produce artificially, upon some glass plates, the matt appearance of ground glass, and as the means for producing the effect is of the simplest, I have thought others might find the method of use under certain conditions. It is sometimes impossible to replace a sheet of ground glass—during a voyage, for instance—and in these circumstances it is well to know how to produce a substitute readily and without much trouble.

Upon a well-cleaned glass plate is poured a warm mixture of—

Gelatine	10 grammes
Water	100 cub. cents.

The gelatine is dissolved in a water bath, and to the solution, which is put upon the fire for a few seconds, is added—

Starch	4 grammes
Water	10 cub. cents.

The starch is properly mixed with the water before being added to the gelatine solution. The whole is boiled for a minute or two. As soon as the starch has become transparent, the boiling is arrested, and the mixture is passed through a muslin sieve. It is now ready for application to the plates, which are rested upon a levelling stand. As soon as the film has set, it is dried in a sheltered position.

The matt surface thus secured upon the glass is admirably suited for focussing; for it is possible to see the most delicate portions of the image without being disturbed by the shining points to be found in ground glass. There is, at the same time, sufficient opacity to diffuse the luminous rays.

I have found it an easy matter to detach the preparation in such a way as to be able to transport such films by themselves; so that one may carry them with other apparatus, and be always prepared against an accident.

To do this, it is necessary to apply some powdered talc to the glass, and cover this with normal collodion, so as to form a film, which will separate from the glass afterwards. Upon this dry collodion the gelatine and starch preparation is poured in the same way as before. When the film has dried thoroughly, it may be separated from the glass without much difficulty.

To employ films thus prepared, at any time, it suffices to float one of the pellicles on water, and slip underneath it the plate of glass upon which it is to rest. The gelatine face should be towards the glass; the whole is removed in such a way that no bubbles of air are formed between the two surfaces, and then the film is allowed to dry, when it fixes itself firmly to the glass plate.

This gelatine pellicle may be employed in all photographic manipulations in place of ground glass. Thus it may be used not only for focussing, but in the production of transparencies for the stereoscope, and for carbon diapositives. It may also be employed in photo-engraving methods to give grains by interposing a very thin pellicle between the cliché and the sensitized surface.

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[*] Read before the French Photographic Society.

The Photographic News.

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FADING OF SILVER PRINTS.

Fortunately for silver printing, it possesses staunch champions who, if encroachments are made on its domain, will dispute manfully every inch of the ground. And the process deserves well such championship. Almost all that is known of the beauty and utility of photography has been due to silver printing. Photography, as represented by the Daguerreotype or collodion positive, must necessarily have been full of interest, but could never have attained the importance which the power of multiplication afforded by silver printing conferred upon the art. And there is, it must be confessed, a fascination about the process in many ways. The facility of watching the process of printing, and carrying to the precise tint desired; the power of modifying the light and shadow, of vignetting and combining, and modifying the artistic effects whilst printing; the power of regulating the tone, imparting warmth or coldness as the subject may seem to demand, whilst in the gold bath; the mastery over the process which experienced men have gained; all these, and many other considerations, plead for a lengthened tenure of existence for silver printing.

The most experienced men know, however, that this tenure must depend on securing permanency in the prints. All other considerations will not save the process if instability be the necessary stigma of the highest beauty the process can produce. In our last, Mr. Russell Sedgfield, one of the most experienced and respected authorities in connection with the art, affirms his conviction that silver prints, fairly treated, do not fade. He admits that some early examples did fade, but refers their production to the experimental period of photographic history. He has no hesitation in making the very bold and definite statement of belief, that now that the proper conditions of working are better understood, "every case of fading is a case of economy, ignorance, or carelessness, or, occasionally, of accident." No man is perhaps better entitled to speak on the subject, and to be heard with respect; and yet we are bound to say that this being his experience, he is an exceptionally happy man amongst photographers.

In our present number, Mr. H. P. Robinson, an authority of equal weight, is directly at issue with Mr. Sedgfield's statement. His experience is to the effect that modern photographs fade, and that those produced a dozen or more years ago did not do so, or at least they did it in a much less serious degree than those of the present day; and he naturally asks for the cause, which he believes must be sought in something else than carelessness, economy, or in the fact that they had their genesis in a country studio.

This latter allusion in Mr. Sedgfield's letter should not be taken in a comprehensive or offensive sense. No one knows better that some of the ablest men connected with photography, and much of the very best work, technically and artistically, are associated with country studios; but Mr. Sedgfield's use of the term may be easily understood. To return, however, to the argument: Mr. Robinson's experience of the fading of modern prints points to what he believes to be the deteriorated quality of albumenized paper, which is now produced at a much lower price than it used to be. Declension in price does not necessarily imply declension in quality; but here Mr. Robinson detects the coincidence of the two facts. He appeals to our own experience of his pictures in confirmation of his statements. We have at this moment under our eyes, as we write, a copy of "Bringing Home the May," a print produced fourteen years ago. It has hung over the chimney-piece of a room in which there is a fire burning probably eight months of each year, and gas freely used during a still greater proportion of the year. We doubt if it has perceptibly changed at all since it was produced. Printed on a sheet of paper forty inches long, from nine negatives, involving several days' printing, the whites at the outset did not from the first possess the pearly brilliancy of a print excited and fixed the same day; but there is no trace of fading, the shadows are a rich purple black, and the whites compare favourably with white paper kept under the same conditions. We have other large prints of nearly the same age, all of which have a similar history and character. These were produced for the most part on English papers, albumenized to order. One of them, nine years old, was treated with collodion, after the fashion introduced by Mr. Valentine Blanchard just at that time, and although hung under similar conditions, in a room in which there is inevitably much of the sulphurous product resulting from the consumption of gas, the print has the purity and freshness of one produced yesterday.

But here is the perplexing difficulty. Mr. Robinson states that many of his more modern prints, produced with the utmost care, have faded. A metropolitan portraitist of large experience, and unusual precision and care in all his work, Mr. Mayland, states similar experience in our last Year-Book. We have prints in our possession produced by Dr. Diamond, produced by ourselves, and by others, upwards of twenty years ago, which are unchanged, and we have many produced by metropolitan professional photographers within a much shorter period, which have faded. As Mr. Sedgfield suggests, many of the prints which fade have been produced at a cheap rate on the Continent. We have a large stock of such; but we have, also, many Continental examples of a contrary kind. Some of Mons. Adam Salomon's prints we have had in our possession nine years are as fresh as on the day we received them. Some time ago we visited the establishment of Mr. England, and he showed us prints produced at the same time under all the same conditions, some of which were faded, and some perfect. The latter were for the most part unmounted, whilst the mounted prints of the same date were yellow, streaked, and fading fast. It is the perplexing uncertainty, the impossibility of guaranteeing permanency, which is the bane of the silver printing process.

Mr Sedgfield suggests false economy and carelessness in production as a chief cause of fading. Beyond a question these are factors in the case. A correspondent in our present issue[*] notes the fact that printers are often an ill-paid body of men, and, as a common concomitant, they are at times negligent, slovenly, and careless. Let those concerned profit by this hint. In the meantime we shall be glad if Mr. Sedgfield can aid those concerned in the maintenance of silver printing to any method of working which shall enable them safely to guarantee the permanency of its results. If this cannot be done, we fear that conscientious and high-class photographers, as well as the incompetent and careless, will be driven, with Mr. Robinson, to the conviction that, although the end is not yet, nevertheless silver printing eventually will, beyond a question, be doomed.

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[*] The letter in question is compelled to stand over until next week, a diagram not having been completed by the wood engraver.

THE PHOTOGRAPHIC ESTABLISHMENT AT WOOLWICH.

[A fellow of the Chemical Society, present last week at "the Science day at Woolwich," when nearly five hundred Fellows responded to an invitation from their President, Professor Abel, F.R.S., the chemist of the War Office, to assist at some experiments in the Royal Arsenal, forwards the enclosed, in the hope that it may interest the readers of this journal.—Ed. P.N.]

In company with some hundreds of Fellows of the Chemical Society, I had the pleasure of making the round of the Royal Arsenal last week, and viewing the wonderful machinery and interesting workshops at that establishment. Not only were we shown the processes of manufacture of guns of every size and description, of bullets and all sorts of ammunition, but we had the satisfaction of beholding the monster gun and seeing it fired. Then came some experiments with gun-cotton, which, though applied to a military and not a photographic purpose, were exceedingly interesting, and after that a fish torpedo was "run" under water, to demonstrate the progress which science has recently made in that branch of warfare.

In the afternoon, after these grand doings had come to an end, I inquired my way to the photographic department in the Arsenal, for I had made up my mind to see that establishment when my visit to Woolwich was projected. I found the establishment, which is a branch of the chemical department, set out ready for visitors, several Fellows, like myself, having taken the opportunity to while away a short time in the studio and operating-room.

I was fortunate in finding Mr. Baden Pritchard at his post, explaining to several gentlemen the intricacies of carbon printing, and, biding my time for a few words of conversation, I entered the studio, where a fine collection of prints of military subjects were on view, all of them, I was told, printed in carbon. The most interesting of these were certainly the series of war pictures which Mr. Pritchard had collected, and which dated from the Crimea downwards. A picture, measuring 10 by 8, of the Redan, and another of the outworks of Sebastopol, taken immediately after the cessation of hostilities, reproduced in carbon from faded silver prints, were particularly pleasing, the reproduction having been made, according to a label affixed, by the aid of the collodio-chloride process. Pictures of the war in China, in which the ground was strewn with the bodies of dead Chinamen as they lay after the taking of the Peiho forts, came next in order, and then followed photographs of Strasburg and Paris, taken during the sieges of those towns by the Prussians, and also of the Paris streets, with the barricades thrown up by the Communists. Other pictures represented our march to Abyssinia, but the last little war on the Gold Coast was unrepresented.

Photographs of the monster gun were not wanting, but the majority of pictures seemed to consist of representations of the iron targets that are fired against at Shoeburyness, and of the various arms used to attack them with. One large album was filled with upwards of a hundred pictures representing artillerymen at drill, working guns and mortars and rockets, and another book contained a series of wheels in a more or less broken condition, which had been photographed, it seems, after having been put to severe tests and failed.

All of these pictures were matt carbon prints, but some photographs of Highlanders and Linesmen had been produced with glazed surfaces. Mr. Francis Dann, who appears to be Mr. Pritchard's right hand, and the chief photographer of the establishment, told me that some of these had been developed on varnish, and some on collodion, and both processes give a surface fine enough for small portraiture. Afterwards, Mr. Dann was good enough to show me the whole process of development, both on zinc plates and glass. I informed him of the difficulty I always experienced in detaching the print from the developing surface after transfer, and he attributed my failures to imperfect waxing of the plate. At Woolwich they employ a mixture of resin and wax dissolved in turpentine for the zinc plates, but this does not answer for glass. Either pure wax, or wax dissolved in benzole, is applied to the glass before the collodion is poured on; the collodion sets, is put into cold water, and then the exposed tissue, previously soaked in water, is applied, and rubbed down with the squeegee. To prevent any rough handling with the latter instrument, a piece of waxed or waterproof cloth is laid upon the tissue before the squeegee passes over it, and in this way no injury is done to the collodion film.

There were very few opal plates used, that I saw, but in order to afford some sort of criterion in development, when employing ordinary glass, a white enamelled plate had been fixed over the developing trough, so that the operator could at any time judge of the depth of his print by putting the developed image over it. I was told that they did not sensitize the tissue in the bichromate bath, but that it was forwarded from the Autotype works, in rolls, twice a week, already mixed with the bichromate salt. There was nothing to do, therefore, but to cut the material into sheets of proper size, and to print it under the negatives, which varied from 10 by 8 to 15 by 12. Pigment printing had been carried on uninterruptedly since the commencement of 1870, and I was surprised to hear that for the last five years there had been scarcely any silver printing done at all at the Arsenal. I think that the number of carbon pictures already printed at Woolwich since 1870 was put down at 50,000, but of this I am not quite sure. This much, however, is certain, that carbon printing has for years past ceased to be a wonder at Woolwich, and the process is conducted with a success and certainty that leave little to be desired.

In reply to my inquiries about failures, I was told that although these, in former years, were estimated fully at ten or fifteen per cent., there were scarcely more than four or five per cent. of spoilt pictures now, if the weather was not too cold or hot, and the supply of tissue of uniform quality. More depended upon a variation in the tissue than anything else.

Before leaving, Mr. Pritchard kindly showed me some of his photo-lithographic negatives, as I professed myself much interested in the process. A tramway carried the camera into the studio, and fixed at right angles was a board to carry the drawing or design to be copied, upon which a cross indicated the centre. With such an arrangement as this, little time was lost in getting the focussing screen of the camera parallel with the copy, and in focussing, the most difficult operation of all. The photo-lithographic process employed at Woolwich, Mr. Pritchard told me, was the method described by Mr. Henry Butter, in the Year-Book, many years ago.

I should much have liked to have inspected the vast laboratories and electrical rooms, which also form part of the Chemical Department; but as there was but half an hour at my disposal it was only possible to give but a very hasty look round. I thought, however, that my crude notes on the photographic establishment might be interesting to the readers of the Photographic News, and with that idea, Mr. Editor, I send them for publication, or otherwise, as you deem fit.

WORKING AN ALKALINE NEGATIVE BATH.

At a recent meeting of the Photographic Section of the American Institute, Mr. H. T. Anthony read our article on Mr. Frank Eliot's method of working an alkaline negative bath, and in the course of the discussion which followed, Mr. H. J. Newton stated some interesting experiences of his own made some years ago, when Mr. McLachlan propounded a new system of working, of which the use of an alkaline silver bath formed part. It will be remembered that photographers generally did not receive Mr. McLachlan's proposals with enthusiasm, and that those in this country who repeated the experiments were not able to announce any resulting advantage. Mr. Newton appears, however, to have been successful in repeating Mr. McLachlan's experiments. One point in Mr. McLachlan's announcement which was received with something of incredulity was his statement that a valuable improvement was effected on crystals of nitrate of silver by exposing them to the sun for some months prior to using them for making a negative bath. Mr. Newton distinctly confirms this, and states that the effect of the sunning was to induce a decidedly alkaline reaction in the solution made from such crystals. Whether the advantages obtained were of a sufficiently definite character to render the use of the method in question worth maintaining, Mr. Newton does not state; but it is interesting at this late period to find a confirmation of Mr. McLachlan's experiments, the details of which, when brought before the Photographic Society at the time, were received with such cold incredulity. At the recent meeting of the South London Society, the same subje came under attention, and Mr. W. Brooks gave some interesting details of his experience, which will be found in the report in our last. Of the American discussion we give the following details, extracted from *Anthony's Bulletin*: —

The President said that he had worked the alkaline bath several years ago, following the formula of Mr. McLachlan, with the exception of substituting ammonia for caustic potash. After exposing it to the sunlight for about three weeks, he could work it in an alkaline condition, and the bath would work as long as there was silver enough in it to make a negative. The negatives were vigorous, clear, and brilliant. The sensitiveness was about the same as that of an ordinary bath. In order to ascertain the action of sunlight upon the salts of silver, he had put crystals of nitrate of silver in a flat bottle, and exposed them for three months to the action of the sunlight, turning the bottle frequently. At the end of three months he made that silver into a bath with distilled water, and it was decidedly alkaline, as tested not only by litmus paper, but by turmeric paper. That bath made perfect negatives in that alkaline condition, but he never found any one who could tell where the alkali came from.

Mr. J. B. Gardner said that the experience of photographers who have neutralized their baths with carbonate of soda had been that it produced pinholes more abundantly than by any other means. It was the practice of Mr. Duchochois, whenever his bath was out of order, to put in a quantity of bicarbonate of soda, and put it in the sun, or heat it, and acidify it. But the plates were often full of pinholes, and it could not be owing to the iodide, because the baths were fresh. In his own practice he had avoided the use of the bicarbonate of soda, and employed the cyanide of potassium, adding a small quantity when the bath was in such a condition that it could not be worked, allowing the cyanide of silver to deposit, filtering it, and putting it back into the bath. With this method the bath would work immediately, and give all the intensity required. Instead of requiring three months for sunning the bath, the whole may be done in ten minutes. It is one of the best means of doctoring successfully a bad bath, when every other means fails, to add the cyanide of potassium.

Dr. M. N. Miller.—Mr. Gardner's doctrine of the bath seems to be rather empirical. The object of the addition of the bicarbonate of soda is to neutralize the bath previous to sunning, so that the organic matter may be precipitated by the light. It is then acidulated by nitric acid, and a nitrate of soda is formed. The best way would be to neutralize the bath by the carbonate of silver, which would avoid the soda, which might form objectionable compounds with other materials subsequently added.

Mr. Chapman.—After using the cyanide of potassium for a while, finding that it worked well, the question arose, whether caustic potash would not do the same thing. I obtained some chemically pure caustic potash, and made it of the same strength, and then I could not perceive any difference in the result.

Mr. Gardner.—I have never found anything equal to the cyanide of potassium to cleanse the bath. I add a small quantity at a time, and dip a bit of litmus paper in the solution, and the moment I see it changing from red to blue I stop, and it throws down a small quantity of the cyanide of silver, which I immediately filter out. In one case I allowed it to stand, but it destroyed the effect I wished to produce. The bath wears out, like any other; but it is a good, practical working bath, and may be relied upon if properly manipulated.

Captain Russell.—If you get in too much cyanide, how do you remedy it?

Mr. Gardner—By adding a little nitric acid you can convert it into an acid bath; and you can convert it again into an alkaline bath, if you wish.

Mr. Roche said that it would be necessary to boil it in order to drive off the alcohol, and boiling is the simplest way to purify the bath.

Captain Russell stated his experience in Saratoga with a bath in which the cyanide of potassium had been put. He had washed it out as clean as he could, had added fresh silver, and filtered; but the longer he worked it, the worse it grew. After returning home he succeeded in getting rid of the cyanide by precipitating the silver with zinc.

* * *

Correspondence.

PERMANENCY AND FADING.

Sir,—I am glad to notice among photographers a desire to produce permanent, as well as beautiful, prints, and to investigate the causes for the want of permanence which has been the curse of silver printing. In a letter in your last issue, I see that Mr. Sedgfield expresses an opinion that most of the faded photographs come from cheap, minor, and country studios. Now I am—and I confess it without any shame whatever—a country photographer, but I cannot see that residence in London would have any effect on the permanency of my prints, but I do think that we may look for one of the causes of fading in cheapness.

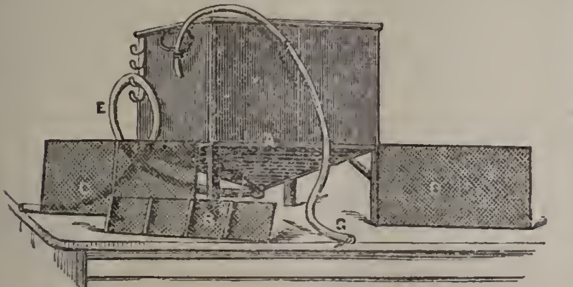
From a long course of observation, I am led to conclude that the chief cause of fading lies in the quality of the albumenized paper employed. Two or three years ago I was induced, by the great beauty of the results to be obtained on it, to use some foreign-made albumenized paper. I printed many thousands of portraits on this beautiful but delusive material, and they are always rising in judgment against me—they have all faded: not a mere loss of freshness, or yellowness in the whites, but the darks have nearly vanished, leaving just sufficient image to indicate to whom the portrait belonged. Of course, I am always glad to exchange these ghosts for new prints, but that can only be done in a few instances, and it is not pleasant to know that there are a few thousand cartes about the world with my name on the back, and worse than nothing on the front. At the time I was using this paper, I was also producing some subject pictures so large that I had to get the paper made especially for them by an English maker. The prints produced on this paper were treated exactly in the same way as the prints on the foreign stuff. I have never noticed any deterioration in the prints on the English paper. You, sir, have some of them, and can testify.

In looking over some old portfolios, the other day, I came upon some hundreds of prints produced by myself and others from fifteen to twenty years ago. In some, the whites had turned slightly yellow, but the majority of them looked as fresh as if they had been done yesterday. Now the question is, Why were the old prints bright and fresh, and why are the pictures printed two or three years ago faded out? In the old time, albumenized paper cost £8 to £10 per ream, and eggs were cheap. Now eggs are dear, and albumenized paper can be had for £5 per ream. Is there anything in this? Can paper at £5 per ream be produced from the fresh albumen of eggs? If so, the old albumenizers must have made sudden fortunes.

After all, there is some virtue in cheapness, if it be really the fact that cheap paper is the cause of fading, for it will drive us to carbon, which I hold, notwithstanding all that has been said to the contrary, to be permanent. At present there is one difficulty about carbon printing, which is at least annoying, if not worse. With some samples of tissue I have produced results which in my opinion were infinitely superior to any silver prints I have ever seen; but with other samples I have not been able to get prints that I dare use. But, after all, this is a minor difficulty, and I have no doubt, from the energy with which it is carried on, and the great desire of the partners to meet all requirements, that the Autotype Company will soon find out what photographers really require, and will be able to supply tissue which can be always depended upon. When great difficulties have been overcome, small ones are not likely to be allowed to stand in the way. When the few remaining difficulties are conquered, silver printing will be doomed. H. P. Robinson.

WASHING MACHINE.

Dear Sir,—Here is a washing machine I have been using for nine or ten years. Its similarity to Mr. Adam Salomon's, in your Year-Book, struck me. If he had used the word zinc instead of wood, and shown it as working on the syphon principle, he would very nearly have been describing this one. There are some minor things about it, however, that are not in his. You are at liberty to use it or not, as you please. It has a perforated false bottom at A, which has projections on it, same as you may notice on B, about a quarter of an inch apart; the outlet is at the lowest part of the machine, and, as you see, the gutta-percha tube E can be raised or lowered, according to the height the water is wanted inside. Cartes are put on B, having five raised parts to keep the prints separate; cabinets on C, having three; and whole-plates on D, having raised ends only. Not being convenient to the tap, a small-size tube (F) is used to let in the water; this is put outside here for the purpose of showing the contrivance for fixing it on the edge of the machine—of course, the end next the catch inside, the end at G attached to the tap.



I suppose there must have been some fading with me—indeed, I do not think it possible that prints from eleven thousand negatives, representing (say) sixty or seventy thousand pictures, could be free from it; but could any reasonable being expect this from a *small man*, when "many of the works of Reynolds, Wilkie, Turner, and other *masters* of the last hundred years, are in a most deplorable condition of decay"? I have before me now, however, two cartes for copying, having destroyed the negatives some years since, and there is no sign of fading or giving way in either. There is also a case of ten pictures in my photo. house here which have been there I don't know how long, but they were exposed in a shop window for (say) two years, and hung up at the back of the counter for another two, and they have been here three years; and though they are a little soiled-looking, no care having been taken to keep them free from dust, there are no signs of fading, so far as I see. But, notwithstanding this, I should be very sorry if anything damaging turns up to carbon, as I have had some very fine things done in it, and to those who do not care about going so far as to have an oil painting, have often recommended it, and backed my remarks by perfect permanency. —I am, dear sir, yours truly, Wm. Colquhoun.

ON THE MOUNTING OF SILVER PRINTS.

Dear Sir,—I shall feel much obliged if you will allow me to say a few words about mounting silver prints, for it has no doubt a good deal to do with the permanency of them. It is an operation carelessly done by many, or perhaps all, photographers, and I think if a little more care were bestowed upon it we should not have so many complaints of prints fading. First of all, the prints should be perfectly dry before they are mounted. The best way to expel all moisture is to place the prints on a hot plate for a few minutes, and then to mount them immediately with Mawson's solution of india-rubber, and finally to glaze them; by this means a layer is formed, both on the back as well as on the front of the print, which prevents all hurtful vapours from getting to it. Of course this will be useless if a trace of hyposulphite of soda is left in the print. I avoid this, however, by using a very simple apparatus for washing the prints. I made a box of a convenient size, lined with pitch, with a hole near the top at the end, into which I fitted a small wooden tap; I placed this box on a shelf just above a tap, into which is fitted a few feet of india-rubber tubing. I place the end of this tube at the bottom of the box at the opposite end to the wooden tap, and, when the box is full, the water runs out at the tap, and by this means a perfect circulation is kept up. After six hours' immersion I take all the prints out and lay them on a clean board, and sponge them each side, and then return them to the water for another six hours. I find this answers very well, though I do not say that there are not many better arrangements.

I feel confident that if photographers adopted my plan of mounting prints, they would not find their prints fade. I never found any of my prints fade which had been mounted in this way. There is no doubt that gas is the cause of the fading of many prints, as a friend of mine unintentionally discovered, who had two large photographs of the ruins of Rome, one of which he put in the hall near the gas, and the other in a place where there was no gas. In a few years the one in the hall had faded, while the other had not faded at all.—Yours truly, R. N. P.

SYPHONS.

Dear Sir,—I feel compelled finally to trouble you with a few lines on "Syphon or no Syphon." It seems to me that "E. L." is writing on a subject altogether foreign to what is intended by Mr. Wane, myself, or any other writer on the point, and that some beginners may be misled.

From "E. L's" description his must be an ordinary dark-room porcelain 12×10 bath, with a spout like a jug. Mine is one of Thomas's 12×10 glass baths in a mahogany case, and a water-tight, screwed down, india-rubber top, as I am a wanderer: everybody knows them. I often have to empty it, of course, and never succeeded in doing so cleanly, as to my hands or the floor, until I discovered at Mr. Solomon's the little syphons I mentioned in my letter in the Photographic News of February 11th, and which I am glad to hear Mr. Hart supplies in various sizes.

I cannot carry bees-wax with me on purpose to make a spout every time I want to empty the holder, according to "E. L.'s" recommendation, let alone the trouble of making it out in the field, when my little syphon does the work for me without any trouble at all.

The syphon can be washed clean (I like the glass tube for insertion into the solution), and there is no danger of damage to the nitrate of silver bath, unless it be used for other purposes.

I have one bath in the holder, and two bottles fitting in a box, one full, the other empty, and change the solution in a few minutes if required. I have no pinholes. A pinch of bicarbonate of soda (if deemed necessary), a good shaking, and a few hours' sunning with proper (very slight) acidification, with nitric acid afterwards, I find all that is needful. I keep my silver bath generally from 30 to 35 grains to the ounce of distilled water by the hydrometer, and always filter after sunning. I use distilled water (which I buy of a druggist) for all my solutions except hypo, and very rarely have had to boil down a bath.—Yours very faithfully, Thos. Parkyns.

Harnham Cliff, Salisbury, March 20th.

SUBSTITUTE FOR GROUND GLASS.

Dear Sir,—As Mr. Gardner says in his article upon the substitute for ground glass, in the News of March 3rd, inventors are too often subjected to the ill natured animadversions of the envious and the cavilling of the litigious. Nevertheless, as the mind of man is not omniscient, hints, observations, or even objections, made in a kindly manner and with due courtesy, will frequently be of service both to the inventor and your readers generally. In this spirit I beg to inquire whether the proposed substitute for ground glass has been submitted to the action of such a degree of heat as that to which it would be exposed under the bright sunlight of a hot summer's day? As resin melts at a low heat, I should much fear that it would do so under the above circumstances, thus restoring the glossy surface of the varnish, and rendering it useless for the purpose required. Your readers will see at once the mischief such an accident would produce. I think a harder and equally useful film might be obtained by simply adding (cautiously) water to white hard varnish before flowing it over the plate, thus causing it to dry with a matt surface, or, as painters would say, appear chilled.

I am pleased to find that many of the observations embodied in my articles concerning the interior of the dark room, published in the News some years since, and referring to the influence of light, heat, and ventilation, upon the health of the photographer, have been confirmed. It is imperative that a sufficient quantity of light (and it is little matter how much, so that it be non-actinic) be admitted into the dark room, so as to reduce to a minimum the baneful effects of the studio, on the contrary, upon the nerves of the eyes of the operator. I have had occasion to study, principally for my own convenience, the building of photographic rooms, and come to the conclusion that the best situation for the dark room is at the end of the building, directly opposite that part where the sitter is placed. This plan has many advantages. By having its door in its centre, its breadth will serve, upon occasions, to increase the length of the studio. But to our present purpose. Your readers will observe that upon opening a door so situated, the eyes of the operator will naturally first fall on the camera, covered with its black velvet or cloth, such an object being the very best thing they could be directed upon at that moment; raising his eyes, he then has before him the neutral-tinted background. Thus, without observing it, his eyes are undergoing a gradual relief from the effects of the darkness to which they have been subjected, and are prepared to bear any required amount of light without injury. I have lately made some inquiries amongst my friends, and they generally report that their eyes are more violently affected by the causes under consideration in out-of-door photography than in the studio. And this appears to be correct, as in the latter case the light is considerably modified and weakened by its situation, its glass sashes, and its blinds. I should consider that great service would be rendered to the eyes of all operators by the use of properly tinted spectacles, called preservers, having no power as lenses.—I am, dear sir, yours truly, James Martin.

5, Clarence Place, Ilfracombe, March 21st.

DRY-PLATE WORK.

Sir,—I saw in a recent number of your journal an inquiry from "Alpha" relative to the best sort of dry plates to use this summer. As you are aware, I have used many plates of several commercial descriptions the past year or two, and have considerable experience as to their value. The plates I would recommend "Alpha" and others—without much expense—to try would be the Liverpool dry plates, and those of the Uranium Company; the latter being more rapid. I would further say that I prefer to get them direct from head-quarters, and not from agents, as the commission given to the agents would go into the pockets of the makers of the plates, and in case of the plates being defective, the companies themselves would be directly liable to the purchasers.—Yours truly,

F. W. Turton, Commander, R.N.

Bedford, March, 22nd.

Proceedings of Societies.

Edinburgh Photographic Society.

The third and last popular meeting of the session was held in Queen Street Hall, on the evening of Wednesday, the 15th. The attendance, as usual, was very large.

The exhibition consisted of a series of pictures of the animals in the Zoological Gardens, in London, interspersed with a large number of views of India.

Dr. John Nicol delivered the descriptive lecture, and stated that although many of the animals had been exhibited before, the committee had yielded to the wishes of a number of members and friends to have them shown again. Fearing, however, that an evening altogether devoted to animals might be somewhat monotonous, he had asked Mr. York, of London, to whom they had been indebted on previous occasions, to send a number of pictures of Indian scenery to be exhibited along with the animals. Mr. York had kindly sent a very large number, and he had selected sufficient for an hour and a-half of what he thought very suitable for the purpose. The pictures were much admired, and the exhibition was in every respect successful.

French Photographic Society.

A meeting of this Society was held on the 4th ult., M. Peligot, of the Institute, in the chair.

M. Perrot de Chaumeux called attention to the Photographic Annuals of this year, and among others, to that published in Vienna, by Dr. Hornig, the President of the Vienna Photographic Society.

M. Darlot exhibited a new cap for photographic lenses.

M. Sabunjie showed a photographic apparatus for working wet plates in the open air. It is of that class of apparatus in which the plate descends into a bath underneath the camera. If dry plates were used, these could be developed on the spot.

M. Perrot de Chaumeux called attention to the medals offered this year by the Vienna Society. This information has already appeared in the News.

M. T. C. Roche communicated his experiments in reference to washed and unwashed emulsions. They had been dried in both cases, and then re-dissolved in alcohol and ether. After a year the unwashed emulsion had lost its sensitiveness, but the other gave good pictures.

The formula of his emulsion was:—

Ether...	768 parts
Alcohol	576 ,,
Bromide of ammonium	22·30
Soluble pyroxyline	22·50

After dissolution, 192 parts of warm alcohol containing 18 parts of nitrate of silver are added, shaking meanwhile, and the next day 24 parts of an iodide solution (alcohol 96, iodide 3,) is added, and the whole filtered. If the plate fog, more iodide is added by degrees. Too much iodide gives a flocculent deposit.

M. Monckhoven communicated an interesting circumstance. He glazed a dark-room, half with red and half with green glass. The mixture of the two lights at a distance from the window appeared white, which was, however, without action upon bichromated tissue. If this light be without action upon collodion, it will be a valuable discovery for operators, as they will be able to judge of their plates better by such light.

M. Dunmore communicated a method for giving prints the appearance of having been produced with Indian ink. He covers with albumen, applied by means of a brush, such portions of the print as are to remain white, and upon the dried albumen he puts wax or paraffin. This done, he passes over the picture a brush impregnated with coffee. The operation is repeated as often as necessary, and subsequently the picture is sponged with warm water, which unmasks it by removing the wax.

M. Balard, the President, was re-elected, and MM. Andra, Civiale, Davanne, Fortier et Martin, the out-going members of Council, were also re-elected.

M. Leon Vidal presented one of his cliché photometers. The same gentleman also forwarded some specimens produced by his helio-chromic process.

M. Carette made known some modifications in printing.

M. Prevel communicated a plan for giving the aspect of ground glass to ordinary glass plates. (See p. 137.)

M. Rousselon presented the Society with a copy of an album representing the principal pictures in the Paris *Salon* for 1875.

The proceedings then terminated.

Photographic Section of the American Institute.*

At the January meeting, Mr. H. J. Newton in the chair, the routine business having been concluded,

Mr. H. T. Anthony read an article from the Photographic News of December 17th, 1875, on the "Working of Alkaline Negative Baths." (For discussion on this subject see leader, page 140).

Dr. Miller read a paper on "Bromide Emulsions" (see our last), and exhibited illustrative plates.

Capt. A. J. Russell exhibited negatives taken in Philadelphia with Newton's emulsion, which had given him as good satisfaction as wet plates had heretofore. He had made 260 negatives with only nine failures.

The President said, at this time of the year the exposure has to be at least two or three times what is required in May or June. In the negatives that I exhibited in June, the exposure was from twelve to twenty seconds. In the fall we should have to give about ninety seconds. As to the time when the chloride should be added to the emulsion, it is impossible to give any definite rule. The action of silver upon the bromide when the thermometer is at zero is very different from what it is when it is at ninety. Six hours with the thermometer at ninety would be equivalent to at least twelve when it is at thirty-two degrees; so that you must gauge the time, to a certain extent, by the temperature of the atmosphere when you make your emulsion. In the weather we have had for the last two months, six hours was just about right, but in the warm weather of the last few days, in six hours it fogged.

Mr. Hoyt suggested that just enough chloride should be added to neutralize the silver, and in that case it may be added at the same time that the bromide is added. In some experiments on this subject, three years ago, he had used chloride of lithium and bromide of ammonium, making the chemical equivalents exactly to balance. He added five grains excess of silver, and then added an anhydrous chloride of lithium, to neutralize the silver. This made an emulsion that worked well until it was all used up. In another experiment, in which he had not taken care to use an anhydrous salt, the consequence was to get a foggy emulsion. If the ordinary crystallized bromide of cadmium is used instead of the anhydrous bromide, there should be an allowance of twenty-five per cent. for the water of crystallization. By neglecting to make this allowance, photographers had sometimes met with trouble, from not having enough of the bromide to exactly neutralize the silver.

The President said the reason for allowing time to intervene after the silver is added to the bromide emulsion is this: there is a continued action going on between the free silver and the bromide of silver, and that action is in one direction. The emulsion is increasing in sensitiveness until it comes to the point where it fogs. At that stage it has reached the maximum point of sensitiveness. If you add the chloride earlier, the emulsion will work clear and brilliant, but will lack in sensitiveness I have added silver after the emulsion is in a good working condition. To three ounces of bromide collodion I added fifty-one grains of silver. That left me two grains to the ounce of silver in excess. With the alcohol used in adding the silver, it amounts about to another ounce, making four ounces. I added six grains of the chloride of cobalt, which is much more than is necessary to take up the silver. To the three ounces you can add six grains more of silver in alcohol, after it comes to a good working condition, which would leave only about a grain and a half of the chloride of cobalt. Yet it will work just as brilliantly, and be very sensitive. The more silver you get in, the greater the sensitiveness.

Mr. Roche exhibited transparent views, and described the process used. He took ordinary albumenized plates, and flowed the emulsion on, and before the film had set, flowed over it an alcoholic preservative.

Mr. Bierstadt stated his experience in reproducing negatives direct. He exposed in the camera, so as to reduce them to the size that he required, and, after developing, put them in nitric acid, and dissolved the image from the film, and re-exposed in ordinary diffused light, and flowed the developer on again. In that way he had succeeded in producing first-class negatives, with all the detail of the original. For a magic lantern, if a single transparency is wanted, instead of making a negative, a positive might thus be made direct.

The President remarked that at the next meeting he proposed to exhibit portrait work done with the emulsion. Some time since he had predicted that some of the younger members of the profession might live to see the nitrate bath numbered among the things that were. He looked upon the emulsion process as in its infancy, as the ordinary photographic process was twenty-five years ago. But the emulsion process was now making such rapid strides towards being equal to the regular bath process, if not superior to it to-day, that he would predict that some of the older members would live to see the time when it would entirely displace it.

The meeting then adjourned.

Talk in the Studio.

Catalogues of Second-Hand Apparatus.—We have just received two catalogues of second-hand photographic appliances, one from Messrs. Watson and Son, of High Holborn, and one from Mr. Morley, of Islington. In each there is a singularly comprehensive stock of lenses, cameras, tents, and photographic apparatus of all kinds, at very moderate prices. Intending purchasers will do wisely to examine these catalogues.

Gradation in Landscapes.—Sir Thomas Parkyns, referring again to this subject, writes:—"I send you my Dalmeyers flap shutter. You will see at one side a small spring of steel, by which you can regulate it to a nicety. This is no invention of mine, but of Mr. H. Paget Swaine, on which I improved. I first used my shutter with a doubled piece of paper, according to his advice, and found it not quite so good as it now is. Mr. Swaine is very ingenious, and is a nephew of Captain Abney. I am sure he will not object to my telling you of this little dodge." The spring in question is attached to the pinion, and regulates the pressure, allowing the shutter to remain in any position it is placed, without falling, and also regulating the rapidity with which it may be moved.

A Startling Statement.—At a recent meeting of the Philadelphia Society Mr. Clemons said that in working over some silver residues a short time since he had extracted 2 ounces, 2 drachms, and 24 grains of metallic silver from 1000 old negatives 8½ by 6½. Plates that had been treated with sulphide of potassium did not yield as much silver as those simply finished without strengthening.

To Correspondents.

J. H. W.—Your studies of a cat are very good and interesting. It is quite possible that they may sell: but the probabilities of that kind do not come much within our range of knowledge. Send some examples to Marion and Co., Soho Square. You are probably aware that a series of studies of cats, in groups and engaged in various comical operations, has been in the market for some years. The series known as "Brighton Cats" are studies from living animals.

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* *Anthony's Bulletin.*

A Subscriber.—Fog on a negative consists of a veil of reduced silver, which covers every portion of the plate without reference to the light and shade of the image; but it is chiefly seen in the deep shadows, such as you mention between the folds of the draperies, &c., or on objects that are black. The deepest shadows or blacks in a negative should be represented by bare glass, or glass with as little veil or deposit as possible. The effect of fog, if it be present in any serious degree, is to reduce the light and shade in a negative, and make the print flat and lacking in brilliancy. An experienced eye will quickly detect its appearance in a negative, both by looking at it and looking through it whilst developing. Its presence generally indicates that the chemicals are not in good order: either the collodion is too new, the bath too old and contaminated, or the developer deficient in acid; or it may result from too much prolonged development. If you do not fully understand the subject, write again.

A. C.—We believe the manufacture of resinized paper has entirely ceased. The demand for it was never large, and gradually fell off, and we have not heard of it as kept by any preparer of paper for years.

Amateur.—With the lens and camera you possess it will not be difficult to contrive additional facilities to enable you to produce transparencies. Having obtained good negatives of the subjects you desire, you require a copying camera, or its substitute in the form of a box, or covered frame-work extending double the focus of your lens. Say the equivalent focus of your lens is 7 inches, the box must be 14 inches long, and your camera must extend 14 inches; at the end of the box there must be an aperture or frame into which the negative just fits. The negative being so placed, and the lens pointed towards it at the other end, the light of the sky passing through the negative and lens to the ground glass will give you the image required for a transparency, which is produced by the wet process in the same way as a negative. This may be intensified and toned, or not, as you wish. If you have any of our back volumes or Year-Books, you will find many articles giving more detailed instructions than we can afford space for in this column.

Alfred Wrenn.—Photographs on opal glass may be coloured in many ways: the best method must depend much on the aim and ability of the artist. Water colours are generally used if a skilled water-colour artist undertakes the work. 2. If coloured in water colours, a matt varnish is generally used to give a suitable surface. The finish and fitting are purely matters of taste, depending upon the purpose and character of the picture. 3. We do not know who will undertake to give you lessons in the processes you require. Mr. B. J. Edwards, of the Grove, Hackney, and Mr. Solomon, of Red Lion Square, will give you lessons, probably, in enlarging, and the Autotype Company give lessons in the carbon process. 4. We do not know the gentleman's present address. 5. There have been many articles on enlargement on a collodion film, either direct on opal glass, or for transfer to paper, both in the News and in our Year-Books. All the articles on producing photo-crayons, both in the News and Year-Books, are practically on that subject. Examine the volumes or Year-Books you have, or let us know what you have, and we can aid you in finding what you want.

Anxious.—The wide angle is better than the rapid for subjects in confined situations; but the latter is best suited for interiors, which are generally dimly lighted. 2. The choice between a new and second-hand lens must be governed entirely by circumstances. If the second-hand one be precisely the lens you require, and bear a maker's name which is a guarantee for its excellence, and is offered at a reduced price, it may be desirable to purchase it, as the best English makers will generally undertake to verify the genuineness of their own lenses when offered for sale second-hand. But if any sacrifice of what is really required must be made in making the second-hand purchase, we should prefer to have precisely the lens we wished, and pay the new price. 3. Howard's tent is regarded as very excellent by those who have used it, and it is somewhat extensively used. 4. A very dilute solution of bichromate of potash will stain deal of an oak tint. Try first on a waste piece of wood to ascertain the strength, as it will darken somewhat, and change from yellow to brown on exposure to light. Some of Judson's dyes very dilute will answer. Quick lime in a thin solution, applied immediately the water is added, will darken the wood. Stevens' oak dye is very good.

A. E. Dighton.—We regret that we do not know of any optician who will be likely to undertake to provide another lens, or rather the two back lenses required to complete your portrait combination. The name of the French maker is one we do not know; and if found, we cannot tell you whether any agent or dealer in this country could get you the lens made perfect at a moderate cost, as the transaction is not a usual one. We fear that you will not be able to get the requisite lenses at all, or, if at all, at a rate which would make the purchase a moderate one. You may use the frontl ens as a landscape lens; but in that case the stop must be placed in front. You may effect this by placing it in the place of the back lens, which will bring the stop in front. The concave side must in this case be placed outward.

A. B. C.—The precise colour of blinds and walls is not of vital importance. The walls we should choose to be of a neutral light grey; the colour of curtain enclosed will serve, but by preference we should select blue for such a purpose.

T. G.—For your purpose a single lens, known as an ordinary landscape lens, will answer best. It is the simplest and cheapest form of lens, and for doing justice to ordinary landscape work will answer well. Get such a lens for 10 by 8 plates of any of the good makers, and you will be satisfied with the result.

Sir T. Parkyns.—Thanks.

Captain Redin.—The letter has been forwarded.

W. Howard.—Received. Thanks. In our next.

Gustavo.—In our next.

Several Correspondents in our next.

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METEOROLOGICAL REPORT FOR FEBRUARY

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven,
36 feet above sea level.

Date.	Barometric Pressure.			Temperature			Direction of Wind at 9 a.m.	REMARKS.
	Morning	Noon.	Night.	Morning	Noon.	Night.		
1	29·20	29·40	29·40	45°	50°	48°	S.S.W.	A little rain at night
2	29·70	29·79	29·80	41·5	47	44	S.	Rain a.m.
3	29·81	29·78	29·70	46	48	40	S.	Showers a.m. and p.m.
4	29·67	29·70	29·50	38	42	39	S.W.	Fair, generally sunny
5	29·70	29·71	29·70	31	36	36	N.W.	Rain p.m.
6	29·70	29·83	29·88	35	41	38	N.W.	Rain a.m. and p.m.
7	29·95	29·91	29·91	37	38	37	W.	Fair, but gloomy
8	29·90	29·85	29·80	35	40	35	W.	Fair, but gloomy
9	29·76	29·69	29·72	35	39	34	S.S.W.	Rain this afternoon
10	29·75	29·75	29·78	38	33	25·5	S.W.	Snow this evening
11	29·70	29·70	—	22	30	24	W.	Fair, generally sunny
12	29·50	29·48	29·46	25	31	30	W.N.W.	Rain a.m. Sleet
13	29·41	29·45	29·39	31	35	32	N.W.	A little snow, with strong wind p.m.
14	29·39	29·20	29·16	31	32	37	W.	Rain this evening
15	29·00	29·00	29·00	45	48	45	S.W.	Rain a.m. and p.m.
16	28·93	29·00	29·00	45	49	45	S.	Rain this morning
17	29·00	29·89	29·20	42	45	48	S.	Fair, generally sunny
18	29·25	28·90	28·80	48	54	46	S.W.	A little rain this evening
19	29·00	29·06	29·00	45	42	38	N.	Showers this evening. Very windy up to 6 p.m. Aurora
20	28·90	—	—	28	50	39	N.W.	Rain a.m. and p.m.
21	29·00	29·24	29·30	45	50	50	W.	Rain a.m. and p.m.
22	29·38	29·38	29·22	48	48	46	W.	Rain p.m.
23	29·18	29·23	29·20	46	41	46	W.	Rain a.m. and p.m.
24	29·18	29·50	29·56	39	47	37	S.W.	Showers a.m. and this evening
25	29·48	29·30	29·21	35	48	46	W.S.W.	Rain a.m. Windy
26	29·10	29·00	29·00	44	50	46	W.	Rain a.m. and p.m. Windy
27	29·07	29·10	29·16	46	49	46	W.	Showers a.m. and p.m.
28	29·28	29·40	29·40	46	—	48	—	
29	29·30	29·36	29·40	48	50	46	W.	Rain this evening

Summary.

	Mornings.	Noons.	Nights
Maximum temperature observed	48°	54°	50°
Minimum ditto	22	30	24
Mean ditto	39	43·4—	40·4

Mean of all observations	40·9
Number of days on which rain fell	23
Number of fair days	5
Number of fair days sunny	3
Number of fair days gloomy	2

Notes.—From the foregoing it will be seen that the variations in barometric pressure during the month were considerable. Since the aurora of the 19th ult. the weather has been very stormy, almost constant rain, with boisterous west winds.

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PHOTOGRAPHS REGISTERED.

Messrs. Tattersall and Rogers, Accrington,
Photograph of Mrs. Bunting.
Photograph of Rev. Dr. Bayley.
Mr. Livock, Lowestoft,
Photograph of the late Shelly Cook.
Mr. Mitchell, Honiton, Devon,
Photograph of a Dead Whale.
Mr. Amey, Landport,
Photograph of "The Woolwich Infant."
Mr. C. Keeping, Exeter,
Photograph of Exeter.
Mr. Wright, Sheerness,
Photograph of Admiral Hastings.
Mr. Slingsby, Lincoln,
Photograph of Group of Lincolnshire Ram Breeders.

The Photographic News, March 31, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Much Ado about Nothing—A New Photographic Reaction—No Collodion—Photographic Art in Great Britain.

Much Ado about Nothing.—While, of course, it is always well to possess information, as much upon minor points as upon the more important matters of photography, still it must often strike photographers that a good deal too much fuss is made sometimes over trifling matters, and subjects are often ventilated at considerable length which would be more in place casually mentioned in some elementary text-book. Beginners often write upon matters about which most photographers would scarcely care to trouble their heads, the latter being perfectly confident of being able to help themselves in this little difficulty, or that, should occasion serve. We were once told by a photographer that he had the question put to him by a beginner, "Of what good was the addition of glycerine to the dipping bath?" When told in reply, by the photographer, that he did not know, having never tried such an addition to his nitrate of silver solution, and moreover had no desire to make experiment in such a direction, the aspirant was of opinion that everything should be tried in photography, otherwise nothing novel would be found out. We hope by this time that the enthusiastic experimenter has tried sensitizing by means of his fixing bath, and developing with varnish, and has rung a whole series of changes with the materials at his disposal. If he has, we shall be quite happy to take his word for the result, without seeing the whole of his exhaustive investigation published at full length. "I have a very good plan of making the collodion adhere to the glass, which I mean to publish," a young gentleman once informed us, and we were sorely inclined to "guess he wired it on." Some photographers are always anticipating difficulties: the breakage of the ground glass, for instance. If they are at all nervous about accidents, we would suggest that the best substitute for one ground glass is another, and if it is worth while taking a bundle of films out with you for fear of accident, it is surely desirable not to forget a spare focussing glass at the same time. No practical photographer would sit at home preparing matt films for such a purpose; and if it did happen that his focussing glass broke and he had no other, there would be several ways in which he might help himself. If he were a dry plate worker, the chances are that the prepared films with which he would be working would answer the purpose of ground glass very well, and he would merely have to transfer one of these from the dark slide to the camera. But if he had merely plain glass available, there would be nothing easier than dulling or dirtying this sufficiently, if only by means of a grass root plucked from the wayside.

A New Photographic Reaction.—Some curious facts interesting to photographers have been made known by Mr. F. Jones, who has been investigating the antimony base called stibine. When this vapour, or gas, acts upon sulphur, the former is decomposed, and sulphide of antimony and sulphuretted hydrogen are formed. This reaction, Mr. Jones informs us, takes place slowly at a temperature of 100° Cent. (boiling point); but if the stibine is allowed to act upon the sulphur in *sunlight*, then the reaction is exceedingly rapid. The circumstance that red sulphide of antimony is formed, constitutes the reaction a most delicate qualitative test for antimony, and it is said that in this way 0·00007 of a gramme of the metal can be detected. Mr. Jones was not slow to avail himself of the valuable reaction he had discovered, and at once proceeded to ascertain of what value it would be for photographic printing. He has been enabled to utilise the reaction, for obtaining photographic reproductions of ferns, by placing them on paper coated with sulphur, and then exposing the latter to an atmosphere containing stibine in the sunlight. The unprotected parts of the paper soon assumed a deep orange colour, while those parts sheltered from the light remained yellow. Mr. Jones is of opinion that this reaction of stibine upon sulphur may be advantageously employed for measuring the intensity of light, and has already been fairly successful in the matter; the main difficulty, seemingly, with which he has to contend, being that of securing and preserving the gas of a uniform strength. While we cannot help admiring the ingenious idea of Mr. Jones in this respect, we scarcely think that the stibium and sulphur reaction will do more than the simpler silver salts with which we have been working so long, whether in improving photography or photometric tests. In Crookes' radiometer and the selenium galvanometer, we have before us two very delicate light tests, which can scarcely be improved upon; and Mr. Jones must give us something very simple and accurate indeed, if he desires to elbow his way to the front.

No Collodion.—A dry process without collodion seems to have been tried in Germany, having emanated, in the first place, from the *Moniteur de la Photographie.* The formula, as given, is as follows:—

Albumen	125 grammes
Honey	110 ,,
Iodide of potassium ...	4 ,,
Bromide of potassium ...	1 gramme
Sea salt	0·3 ,,

This mixture is briskly beaten to a froth, and afterwards permitted to rest four-and-twenty hours. The application is simple enough; a well-cleaned glass plate is poured over with the mixture after it has been filtered, and then put into a desiccating box to dry. Afterwards the plate is sensitized in the ordinary manner. As there is no water present in the mixture, the same must be very thick, and for this reason the filtering operation, we should think, would be the most difficult of all.

Photographic Art in Great Britain.—English photographers hear a good deal at times about the superlative work of their brethren on the Continent, and are not unfrequently reminded of the superiority of the photographic work there executed. As a fact we know, of course, that we can hold our own very well as regards landscape photography, and it was, indeed, only the other day that English landscape photographers received a handsome compliment in this respect from Professor Vogel, of Berlin, than whom a more competent judge could hardly be found. So far as our portraiture goes, there is no doubt that the Paris, Berlin, and Viennese photographers produce a more brilliant and attractive picture to the general public than we generally do in this country; but the extra finish is due rather to exquisite retouching than to superior artistic or photographic excellence. Indeed, the studies of Rejlander have never been equalled by the work of any foreign artist. But we were rather surprised, the other day, when informed by an English landscape painter that, excel in what we might in this country, photographers were far behind those of Paris in reproducing sketches and paintings. And in proof of this statement he produced such charming examples of photography having all the effects, together with the softness and harmony, of the paintings, that we admitted at once that they were decidedly superior to work of this kind produced in England; but we pointed out a reason for this, which was, that while in Paris this branch of photography was made a speciality, with us such work was as good as prohibited. What was our surprise, however, to find, on examining the reproductions more closely, that they were some of the late Mr. Bingham's work, who, as many of our readers will remember, moved to the French capital some years ago, when he found that the art of copying pictures by photography, in which he particularly excelled, was forbidden in this country. It is a well-known fact that in this kind of work Mr. Bingham remained *facile princeps* to his death, while his firm, we believe, still continues to produce some of the finest reproductions of this kind that are to be purchased.

FURTHER RESEARCHES RESPECTING THE INFLUENCE OF VARIOUS BROMIDES ON THE COLLODION EMULSION.

BY L. WARNERKE.*

In pursuance of my experiments described at the last meeting of this Society, the following eleven salts were investigated :—

(1) Bromide of calcium,
(2) Bromide of barium,
(3) Bromide of strontium,
(4) Bromide of lithium,
(5) Bromide of copper,
(6) Bromide of magnesium,
(7) Bromide of manganese,
(8) Bromide of methylal,
(9) Bromide of naphthaline,
(10) Bromide of ethyl,
(11) Bromide of quinine.

No. 8 is a solution of one drachm of bromine in one ounce of methylal—a colourless liquid of very pungent smell, but quite different from bromine, provoking discharge from the eyes and nose.

The following are the combining proportions with silver, expressly determined for the samples of salts investigated :—

	Calcium bromide.	Barium bromide.	Strontium bromide.	Lithium bromide.	Copper bromide.	Magnesm. bromide.	Manganse. bromide.	Methylal bromide .	Naphth. bromide.	Ethyl bromide.	Quinine bromide.
								min.	min.		
Quantities necessary for conversion of 1 gr. of silver nit.	0·80	0·95	0·985	0·659	0·665	0·865	0·746	2·115	8·66	?	2·5
Silver nitrate necessary for conversion of 1 gr. of bromide	1·250	1·052	1·014	1·517	1·503	1·155	1·340	...	...	?	0·400

All these salts are very soluble in alcohol, except barium, which is not perfectly soluble.

In the preparation of the emulsion, all conditions, as far as possible, were maintained identical with those formerly described, viz., collodion made with 8 grains of high-temperature pyroxyline in 1 ounce of equal proportions of alcohol and ether; 17 grains of nitrate of silver per ounce of emulsion in alcohol and water were added, and various bromides were calculated, so as to convert 14 grains of silver nitrate; aqua regia was added in quantity to convert 1 grain of silver; after twenty-four hours' standing the emulsion was spread on glass (when set), washed, dried, and re-emulsified in the equal proportions of ether and alcohol; 20 grains of dried pellicle per ounce of solvents.

As on the former occasion, the appearance of different emulsions varied considerably. The most opaque were barium and methylal; lithium was the thinnest.

The equivalent of ethyl bromide, unfortunately, was not determined, because this salt, when added to the aqueous solution of nitrate of silver, after six hours, did not give any perceptible precipitate; so I added it at random to the collodion, about 10 min. per ounce. After ten days' standing, with occasional shaking, the emulsion looked rather thinner than any of the others; but in washing, it was discovered that the emulsion contained excess of bromide.

The behaviour of the quinine bromide was quite unexpected, for when added to the collodion it instantly *solidified* it. I purposely italicise the word *solidified*, because it was not a precipitate, so well known to early emulsion-workers; but all the mass became solid, just as if alcohol and ether were not present. This is a property of pyroxyline never before observed, and which may find some practical application in the future.

When exposed before washing, calcium, strontium, and lithium gave a very good and clear image; all the rest were foggy.

Further experiments proved also that emulsion prepared from calcium, lithium, and strontium with excess of silver does not require even aqua regia to counteract the fogginess.

After washing, all the samples gave good and clear negatives, but varying considerably in sensitiveness, intensity, and colour.

The following is the approximate classification, according to the various qualities observable :—

Opacity of the film.—Barium, calcium, methylal, lithium.

Sensitiveness. — Barium, calcium, manganese, lithium, magnesium, strontium, methylal, copper, ethyl, naphthaline.

Intensity. — Copper, lithium, barium, magnesium, strontium, manganese, methylal, calcium.

Blue under the action of daylight.—Calcium, methylal.

Brown under the action of daylight.—Barium, magnesium, lithium, manganese.

Slate grey under the action of daylight.—Strontium, copper.

Greenish grey under the action of daylight.—Naphthaline, ethyl.

Visible action under the yellow glass.—Calcium, naphthaline, barium, strontium, copper, lithium, manganese, magnesium, ethyl, methylal.

Observing some excellent qualities in the emulsion forming my present subject of investigation, I compared them with those previously described, and found that barium, manganese, and calcium can be favourably compared with zinc. Even barium is rather more sensitive than zinc. Strontium and lithium gave also excellent results. It is a little less sensitive; but, certainly, in the preparation it never fogs, and a brilliant and vigorous image is ample compensation for this little defect. From the examination of general specimens an unfavourable opinion would be formed of copper emulsion, because the development in this case is very slow; but in other emulsions we cannot secure by prolonged development so many good qualities we like to see in a successful negative, preserving indefinitely perfect transparency in the darkest parts. I imagine that addition of copper to some other more sensitive bromide (calcium, for example) would secure the best results.

I may state on this occasion that, in my judgment of different emulsions, I did not satisfy myself with comparison by a single negative, but I adopted the most suitable developer in each case, and only after comparison of several results formed an opinion.

Difference between visible action produced by daylight and by light passed through a yellow glass, naturally tempted me to solve the question, What is the influence of different bromides on the invisible but developable action produced by the coloured rays? With this object in view several bands of coloured paper were pasted on to cardboard with the name of the colour written in black; narrower strips were pasted across, so that by these means every colour could be observed in contact with all the others, and that facilitated comparison of the actinic action in the negatives. Separate negatives were taken on each emulsion, which are now on the table for comparison. The variation of intensity and sensitiveness of different emulsions makes it extremely difficult to form a judicious classification; but even at the first glance it is unmistakably evident that the various bromides in the emulsion produce marked variations in the sensitiveness to different coloured rays.

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* Read before the Photographic Society of Great Britain.

The following is the list in order of sensitiveness to the less-actinic colours:—Na, Zn, Cd, K, NH_3, Li, Methylal, Ethyl, Ba, Ca, Mg, Br, Cu, Sr . . . . U, Fe, Mn. I am not at present in possession of a suitable spectroscope to test the sensitiveness of my emulsions to the different lines of the solar spectrum; but, considering that by the addition of coloured substances to the emulsion marked effects were produced in photographing the solar spectrum, and yet no difference was observed when coloured pigment was photographed, I imagine that, if my experiments were repeated with the solar spectrum, more definite differences would be observed.

These further researches confirmed me still more strongly in the opinion expressed on the last occasion, that haloid bases exert a powerful action on the pyroxyline in the collodion. The editor of the *British Journal*, in his highly flattering criticism, calls this action aging. It seems to me, however, that there remains in the emulsion, notwithstanding washing and drying, some more tangible trace of the haloid salts used than merely catalytic action; and, in proof of this, I take, for example, methylal emulsion, also washed, dried, re-emulsified, and dried on the glass again, yet it reveals to the sense of smell what was the substance used in the preparation of it. Here I must notice that methylal and methylal bromide are perfectly soluble in water, and the washing was exceptionally long and thorough, to avoid torture to the eyes in drying.

Another example I should not like to omit is ethyl bromide emulsion. The collodion, which was powdery and rotten, became so contractile that it could not be kept on the glass, but cracked as soon as it became dry. But in connection with this emulsion another remarkable fact is worth noticing. The ethyl film, when examined by transmitted light, presented the most curious phenomenon of dichroism: rose and beautiful green light are transmitted according to the angle of observation; when it is kept quite close to the eye, only green colour is transmitted through the dry film, and rose through the wet.

The examination of unwashed ethyl emulsion is still more curious. When the glass covered with this emulsion is heated, the film acquires, according to the intensity of the heat, the power to transmit all the colours of the spectrum (and these are most clear and vivid) in the following order, beginning from the highest temperature—yellow, orange, red, violet, blue, green.

I am at present investigating the action of heat on the emulsion, and I hope that dichroism and thermochroism of ethyl emulsion will be of great use in these investigations.

HOW TO CLEAN GLASS.

BY P. B. GREENWOOD.*

My topic is not a very imposing one, but still very important to every photographer. It is absolutely necessary that the glass used for our purpose should be thoroughly cleaned. It is the starting-point for good, clear, clean negatives. In laying before you the plates I have this evening, it is that you may better understand what I offer here. To clean the glass for the substratum of albumen, put the plates into a strong solution of concentrated lye or potash; let them remain for twenty-four hours, or, if old negatives, until it removes the film. From this solution scrub thoroughly with a woollen cloth; then rinse well under the tap. After rinsing, put the plates into a weak solution of commercial nitric acid and water, where they should remain for twenty-four hours, or longer. If you are pressed for time, use a stronger acid solution. From the acid solution, wash thoroughly under the tap and flow with albumen prepared as follows:—White of one egg, beat to a froth and left to settle. When settled add eight ounces of water. To eight ounces of water add ten or fifteen drops of carbolic acid. Pour the solution of albumen into the solution of carbolic acid, shake and filter, and it is ready for use. I find this solution has excellent keeping qualities. You can add a few grains iodide of potassium if you like, but I do not consider it at all essential. (As you noticed, I prepare my plates dry, preferring that method.) After the glass is flowed with the albumen, place it in a rack in a room free from dust, for specks of dirt are sure to cause streaks, spots, or pin-holes in your negative. After the plates are thoroughly dry, my final cleaning is done with a tuft of cotton-wool, wet with alcohol; wash it over the albumen side of the glass, and dry with two or three changes of cotton. By this method you are sure of clean glass and a surface free from all dirt spots. Any one that believes the albumen adhering to the back of the plate injures the bath, has only to moisten a tuft of cotton with alcohol, and go over the surface of the plate as I have described. In this connection I will quote from a writer in a London journal, Mr. Samuel Fry:—"A common agreement seems to have been arrived at, that it is a *sine quâ non* that no albumen shall under any circumstances be allowed on the back of the plate, because it will fog the bath. Finding the labour of wiping the superfluous albumen from the back of plates very onerous, I thought I should like to know just what would be the effect of albumen in the bath, and I therefore set aside one bath and six dozen plates prepared by pouring on albumen while the plate was wet, and in all of which I was sure the albumen went over the back. I had a theory as to what the result would be, and it turned out just as I expected, and contrary to what we have always been told—the albumen has no effect whatever. Three weeks have elapsed, and about nine dozen half plates prepared as stated have been through the bath of about eighty ounces, and it works just as well as ever, perfectly clear in the shadows, and full of harmony and half-tone. The *rationale* is obvious: the bath is a strong one—forty grains—and at once coagulates the albumen, which becomes immediately innocuous. I can imagine that if a weak bath were used the results might be different, solution of the albumen occurring, and the organic disturbance being created." You will notice that Mr. Fry's experiments demonstrated to his mind that no trouble was to be feared from the albumen on the back of the plate. Portrait photographers have but little trouble with their glass, but those following landscape photography are more or less troubled. The changes of temperature, extremes of heat and cold, dry and wet, and the dampness of the glass, is one of the worst obstacles we have to contend with. I will give you Ackland's formula for preparing and using albumen, which I see Mr. John Carbutt finds so reliable that he adopts it, and I will use his words from an article in *Mosaics* describing it. "I prepare it in the following manner:—Open twelve fresh hen's eggs, place the whites in a shallow dish, take forty minims glacial acetic acid, add to half an ounce of water; with a strip of glass stir the whites, dropping the dilute acid in; continue the stirring leisurely until the coagulum you will see forming spreads through and is incorporated with the before clear but viscid albumen; it will occupy for this quantity about a minute to a minute and a half. Now leave for about an hour, when you will find the fibrous matter collected at the surface; pour the whole on to a damp cloth or flannel placed over a funnel, when the clear albumen will pass through, and the slimy mucus will remain behind. To clear the albumen add one fluid drachm of ammonia, keep corked up, and you will have albumen purified and ready for use. For preparing negative glass use one part of this purified albumen to twenty of water." The method of cleaning glass that I have given you has proved with me the most successful.

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* Read before the Chicago Photographic Association.

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NOTE ON PHOTOGRAPHING THE LEAST-REFRANGIBLE RAYS OF THE SOLAR SPECTRUM.

BY CAPT. W. DE W. ABNEY, R.E., F.R.A.S., F.C.S.*

ANXIOUS to repeat the experiments of Dr. Vogel and Capt. Waterhouse, I have, during the last six months, when opportunities occurred, endeavoured carefully to follow the directions of the former gentleman. The addition of dyes to the collodion added to the length of the spectrum capable of being photographed; but the time taken to impress the necessary image was with me so great, comparatively, that I endeavoured to ascertain if some quicker means of impressing the red end of the spectrum might not be obtained. Without doubt, the red and other dyes mentioned effected all that was believed of them; but it struck me as being essential to find out really what part they played in rendering the film sensitive.

After a long and tedious examination, I found that nearly every gum-resin added to the collodion gave a certain prolongation of the spectrum—some more and some less—whilst other organic compounds gave prolongations which seemed promising; the more colourless the resulting salt of silver was, the more extended became the spectrum. Omitting the bromide from the collodion entirely, and carrying out these examinations, one gum was at last hit upon which was capable of giving a definite spectrum below A to some considerable distance; and adding this to the bromized collodion, still better results were obtained, with certainly much shorter exposures than were necessary when any dye was employed.

I do not now propose to carry my hearers through the tangled maze of the various agents employed, as I hope soon to publish a longer and fuller account of all the difficulties I met with in fixing on that body which seems to give me, for the present, the fairest chance of success. That which I selected I have worked with for some little time. It is a simple form of resin, obtainable in commerce, added to an organified collodion containing bromides, and, in some cases, bromo-iodides. The sensitive salt is nearly pure white; and I find that the nearer it approaches to white the more sensitive to all rays does it become. The addition of a coloured dye to it diminishes the sensitiveness in almost exact proportion to the depth of the colour, which agrees with Dr. Vogel's statements on the subject. My belief at present is, that the aniline dyes employed by this learned gentleman and Capt. Waterhouse combine with the silver and silver bromide left in the films to form compounds of a resinous nature, and that these organic silver salts are sensitive to the red or other rays, as the case may be. To me it seems natural that they should be most sensitive to those rays which they can transmit, though not so sensitive to the whole of the spectrum as they would be if the compound chanced to be white, and allowed all rays to pass.

I show two photographs of the spectrum commencing near F, and extending towards the ultra-red rays. In one case the exposure given was ten times that necessary to impress the sensitive compound by the blue rays; in the other about twelve and a half times. In the first case the spectrum can be traced as far as B, whilst in the last it is seen down to A and a little below it. These two photographs were taken when the sky was often covered with clouds and the atmosphere was generally unfavourable; but I have selected them as being nearly in focus, and being taken with the slit of the spectroscope very nearly closed. (The matter of focussing is much more difficult than any one who has not tried to effect it is aware of.) In earlier photographs (taken a month back) the length of the spectrum impressed was much more considerable than in either of these. In one case a distance equal to D-A was obtained with fairly defined lines, *not* reversed, as in the spectrum published by Capt. Waterhouse. I believe that with a good condenser, properly arranged, and a bright sun, with ten minutes' exposure, all this ultra part of the red may be photographed. The great difficulty to encounter is the focussing, which can only be accomplished by trial and error, or by very elaborate calculations, which I have not had time at present to undertake.

With uranium and iron salts, successful spectra have also been obtained. In the latter case the difficulty of a suitable developer was much felt, though at length it seems that such a one has been found which will answer; with a bichromate compound, too, a fair measure of success has been arrived at by following the method I previously published of giving a slight preliminary exposure. The photographs by these methods I have designedly refrained from showing, as at present they are in a crude state, badly focussed, and merely experimental; and the weather has been such as has prevented me from obtaining better.

This, then, is the summing up of my results with these compounds:—

(1.) The sensitiveness of the film depends upon the addition of carbon compounds to the silver salt.

(2.) That the effect of the addition of dyes to the film is to cause sensitiveness in the film, owing, probably, to their chemical composition rather than to their colour.

(3.) That it is probable that the metals of lowest atomic weight (which can be shown to be at all sensitive to the action of light) are those which can be (proportionally) affected the most readily by the least-refrangible rays.

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MY EXPERIENCE OF PIGMENT PRINTING.

BY DR. J. SCHNAUSS.*

THERE have been as yet very few communications in journals upon the phenomena and failures in the carbon or pigment process. The following lines, written more especially to aid beginners, should not, therefore, be unwelcome to the readers of this journal, although my observations in this branch of photography are by no means concluded. I only wish that my remarks may call up some others from experimenters and workers in the same direction. What is now to be found in the journals is for the most part the general description of the process such as has appeared from the pen of the Editor in this paper during the past year or two. I will therefore consider as a matter of course that my readers are already familiar with the process in a general way, and are conversant with the various manipulations.

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* Read before the Photographic Society of Great Britain.

* *Photographische Archiv.*

The pigment printer may be congratulated on finding his materials for the most part ready prepared and to hand, for he has, at the most, simply to prepare the chromate and alum baths.

Whilst in the silver process it was a question of the sensitive film being changed chemically and in its colour, in the pigment process one has to do with a uniformly coloured film, which is only dark by reason of its thickness, and which always yields the same tones throughout. In the silver process, as we know very well, the tone varies very much with the density of the negative, as also with the nature of the toning and fixing baths. In the old printing method there are so many complicated reactions at work, that most of the defects arise from this cause, while in carbon printing the simplicity of the manipulations brings the defects within a very narrow limit. The very simple chemical reaction in connection with the insolubility of the chrome-gelatine by light is easy to control, but, on the other hand, far more mechanical skill is necessary, and the defects which arise are most frequently to be ascribed to defective manipulation, or are of a physical nature, provided, of course, that one is employing good materials and a well manufactured pigment paper. This latter varies in the colour and thickness of its gelatine film according to its nature, whether it is designed, that is, for portraits, landscapes, reproductions, diapositives, &c. The thinner the film the easier may the tissue be handled; but for diapositives such material is unsuitable, as the pictures have not then sufficient vigour. The thicker tissue, especially when it has remained for some time in a dry spot, becomes very brittle. It is better not to have it rolled up, but cut into pieces suitable for use, being kept in this manner flat under slight pressure. The same manner may be adopted for preserving the sensitized tissue.

The advantage of drying the tissue quickly by pressing it with the squegee immediately after sensitizing, as recommended by Dr. Vogel, I have not been able to substantiate, although I have found that injuring the back of the paper by rubbing may be prevented by placing a piece of waterproofed or vulcanized fabric upon the sheet before the squeegee is applied. After the tissue has been dried in a warm room it is my custom to cut the proper sizes for the negative, and to press the sheets upon one another, so that they may suffer no injury from breaking or from the action of daylight.

In choosing my negatives, if I can do so, I prefer a soft and unintensified negative, or, at any rate, one that has been intensified but very little, to a vigorous cliché; for the contrasts are far more marked in pigment printing than in the silver process. Beautiful as the mirror-surfaced chromotype appears when printed from a soft negative, it is the very reverse when it is the proceed of a vigorous or under-exposed negative. In the latter case the hard white lights are really a trial to the eyes.

Beginners will, as a rule, as in the negative dry process, even when aided with a photometer, expose too short a time, as they have all read of the marvellous sensitiveness of bichromate tissue, and do not make sufficient allowance for the density of their negatives. Again, they will find their inexperience often leads to failure in the using of the hot-water bath, for the latter attacks the tissue very much at first, especially if a stream of warm water is allowed to fall upon the tissue from any height. It is necessary to be very careful in this matter, and not to hasten the development too much. It is inconvenient, to some extent, to have a large body of perfectly pure warm water. Water that has been standing some time, or boiled spring water, contains a quantity of fine particles of carbonate of lime, which may easily destroy the picture on being poured on to the film, for the warm gelatine holds fast to any mechanical impurity, so as to be not easily removed afterwards without injury. Any such impurity should be sought to be taken from the film by means of a fine brush; or a stream of water will sometimes assist matters. When the film has once dried, however, and it is sought to remove a speck with a needle, or other pointed instrument, it is as likely as not that a whole bit of the picture will fly off. At any rate it is requisite that the washing water should be first filtered, which is rather tedious in the case of so much liquid; or the supply pipe may be stopped with some suitable material which will prevent the grosser particles of impurities passing into the developing tank. River water, or, better still, rain water, is to be preferred.

Care must be taken to prevent rubbing the squeegee over the tissue roughly, when this is placed upon the collodion film prior to development. It is frequently the case that the delicate pigment image is injured from rough treatment in this respect; the film may slip, or bubble-shaped defects are produced by imperfect contact. Before the paper backing is removed subsequently, in the development trough, the pigment must be thoroughly saturated, and signs of peeling must be apparent. By permitting the tissue to remain too long upon the collodion film before it enters the bath, the tissue becomes very insoluble, and from this cause defects frequently arise.

Neither do I recommend that the pigment paper should remain long after it has been printed, as development is thereby rendered more difficult. It appears to me advisable to employ the mask of paper or safe-edge that has been recommended. A strip of yellow or red paper put on the inside of the negative, and laid at the lower margin of the print, allows of the possibility of bringing the name of the firm or photographer upon the print, supposing it is printed first of all upon the transfer paper to be used. If the picture is in oval form, such a precaution is, of course, unnecessary.

The separation of the print from the glass will succeed the more easily the larger the amount of wax upon the glass, and the more uniformly it is spread over the surface. The solution of wax in benzole, while at rest, precipitates fine particles, and for this reason the liquid before use should not be shaken, and the picture comes off the glass better, but the surface of the glass gets dull. The beginner must not grow impatient in trying to get the picture from the glass, otherwise it is easily torn. He can always try at one of the corners whether the picture will leave, as it remains moist at the edges longest. The paper requires to be perfectly dry.

If, when upon the glass, the developed and dried gelatine print is immersed in water containing a few drops of fuchsine (aniline red) in water, so that the liquid is slightly tinted, the pictures when finished assume a rosy hue in the lights, and appear like prints upon rose-albumenized paper. For landscape pictures other aniline tints may be employed.

Any retouching that is desired must be undertaken upon the glass after the print is dry, and before the pictures are immersed in the alum solution, by means of albumen colours, that is to say, pigments mixed up with white of egg. To guide one in developing on glass, it is necessary to have a sheet of white paper handy, for the closer the transparent image is pressed to a white surface, the darker the former appears in the shadows, and the lighter in the high lights.

It is sometimes difficult to clean the glass plates, but I have found prolonged sojourn in strong soda or potash solution of much avail under the circumstances.

The Photographic News.

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FRATERNITY AMONGST PROFESSIONAL PHOTOGRAPHERS.

The absence of anything like *esprit de corps* amongst professional photographers, generally, is a constant source of regret to many of the fraternity, and for years past we have been in continual receipt of letters, from time to time complaining of the lack of unity, and of the absence of any organisation for confederated action, at any time when the interests of the profession may demand such confederacy. We were recently asked the question, by a well-known professional photographer, whether we thought the profession would support him in trying an action at law to test the claim of the photographer to a property in the negatives he had taken. He had for years past been in the habit of taking photographs for a manufacturing firm, and delivering the prints as they ordered them. For these he was regularly paid. Recently the firm conceived the idea of having the work done by one of their own people, and sent to the photographer to deliver the negatives taken during several years past, which they alleged were their property. Thsi claim was,of course, repudiated, and they at once proceeded by an action at law, now pending, to endeavour to make good their claim. Whether the photographer win or lose in such a suit, it may cost him more than the value of the negatives. In the interests of the profession he believes that it would be well to have such a case fully argued and decided in one of the higher courts; but such a process is costly when undertaken at the expense of an individual. Hence his question as to whether he thought the profession would aid him if he pushed such a suit to its extreme issue. We could not give him hope of any monetary support in such a case, for even if some were willing, no organisation for considering, discussing, and deciding what should be done, or of combining to do it, existed. The photographic societies already in existence do not take interest in commercial questions; and matters of vital import, such as copyrights and ownership of negatives, besides many more essentially trade questions, cannot be discussed by them.

We have no project to bring forward to meet the case, but we place the matter from time to time before our readers as one worth consideration. Some of our readers have from time to time referred to the National Association in the United States as furnishing an example of a happy combination, in which all questions touching the science, art, or commerce of photography might be discussed, and as a confederation of all the photographers in the country ready for united action whenever it should be needed. This is, indeed, somewhat like the theory of this Association; but as a practical fact it cannot be called a success. Last year it held no annual meeting at all, and it seems doubtful at the present moment whether it will hold a meeting this year, or simply die out. In short, the same indifference amongst professional photographers to community of interests seems to prevail in America, where an organization does exist, as that complained of here, where no such association has ever been formed. A correspondent of our Philadelphia contemporary bewails this state of things. He says:—

"It is pitifully true that New York portrait photographers have not enough community of interest in each other as fellow-craftsmen, to maintain a photographic society, except one entirely German. The 'Section' of the American Institute can hardly be called a Society, and none of the prominent photographers ever attend its meetings. And with the exception of Mr. Bogardus—whom we have all 'delighted to honour' for his earnest and unselfish labours in founding and conducting through infancy our still unweaned and not-able-to-go-alone National Photographic Society—all our prominent photographers have resolutely kept aloof from all society communion; and some of them 'make no bones' of saying they will not help to teach country photographers against their own interests.

"Mr. Sarony, whom all admit to be our far-advanced leader, will hardly own he is a photographer. 'He' is an 'artist,' and takes no stock with photographers, unless he has something to sell them; also, Mr. Mora, his former pupil and present rival, who imitates him in everything, does likewise in this of having no society lot or interest with the craft. It is even rumoured they, with Mr. Kurtz, and some others equally endowed with exalted consciousness of their own merit, are too proud to exhibit with 'common' photographers in Photographic Hall, and have secured space among the 'artists;' but that must be a mistake."

Possibly the allusion in the letter just quoted explains, to some extent, the absence of cohesion or community of interests amongst the profession. Brief as is the period in which photography has called into existence a distinct community, caste has already found a home there. The successful artistic photographer is indisposed to make common cause in any matter with his humbler brother. In this case nothing but the absolute imminence of some common danger will probably give rise to a common bond or confederated effort.

◆

BOIVIN'S DRY COLLODION PROCESS.

As several of our readers have testified an interest in M. Boivin's dry process, the chief point of which lies in the circumstance that the author of it puts silver into his collodion instead of iodizing salts, while the dipping bath is made up with the latter, thereby permitting the preparation of the plates in daylight, we have considered it advisable to give the details of the process in full, in the author's own words. M. Boivin, in communicating to the *Moniteur de la Photographie* the process as it stands in its most recent form, says:—

I reverse the ordinary wet collodion process in my method; that is, I employ silver in my collodion, and iodide of potassium in my sensitizing bath to produce upon a plate a film of iodide of silver, insensitive to light, this film in its turn serving to support another, composed of iodized albumen varnish. I thus obtain, by one single sensitizing operation in a bath, two films of iodide of silver, the one in the collodion, the other in the varnish.

I prepare my plates in full daylight, because the iodide of silver film formed in the presence of an excess of iodide of potassium does not happen to be sensitive to light; an iodide which is sensitive to light is only formed when there is an excess of nitrate of silver present. It is this particular property of iodide of silver that I have taken advantage of, so as to be able to prepare my plates in full daylight with comfort, and to obtain, as I have said, by means of one single sensitizing operation, two sensitive films upon the same glass. As the film of iodide of silver in the collodion is more impressionable than that in the varnish, it follows that, by having recourse to a medium exposure, it is possible during the development to moderate the result and secure a proper image.

By sensitizing the albumen varnish in a bath of aceto-nitrate of silver, the albumen becomes coagulated, and retains and fixes the collodion to the plate; one need not fear, therefore, that any accident will happen to the film, as is often the case in the tannin and other processes.

The clichés secured by this method are rarely fogged, nor do the plates prepared by this process seem afflicted by the phenomenon which is usually termed solarization. I have managed to get the same kind of clichés by exposing five and thirty minutes, the pictures obtained with five minutes' exposure having a greenish tinge, while those exposed for thirty minutes possessed a red tint. The positive images produced were the same, with this difference—that the printing of the red-tinted negatives was a longer operation than with the greenish films.

To work a dry process three things are absolutely necessary and indispensable:—1, iodide of silver; 2, organic matter; 3, an alkaline body.

My process also necessitates these products, viz., iodide of silver, albumen as the organic matter, and, lastly, acetate or carbonate of soda during the development, to take the place of the alkaline body. If the acetate or carbonate of soda is suppressed in the reducing agent, it becomes necessary to augment the exposure considerably, and the image is only developed with considerable difficulty, and without details, while the contrary is the case if acetate or carbonate is present. Whether these substances are in the developer as accelerating agents, or for furnishing an alkaline substance, soda, is a moot point; but they certainly favour development, and their great utility I have abundantly proved.

COMPOUNDS EMPLOYED IN THE PROCESS.

Collodion.

Alcohol at 40°	40 cub. cents.
Crystallized or fused nitrate of silver	1 gramme
Ether	60 cub. cents.
Soluble pyroxyline	1 gramme

Ether-Alcohol Mixture to render the Collodion more fluid.

Ether	60 cub. cents.
Alcohol	40 ,,

After the plate has been coated with the silver collodion it is plunged without delay into the

Iodide Bath.

Distilled water	100 cub. cents.
Iodide of cadmium	2 grammes
,, ammonium	1 gramme
,, potassium	2 grammes
Bromide of potassium ...	1 to 2 ,,

After the plate has been dipped, it is washed with rain-water, and then, having drained, two applications are made of—

Albumen Varnish.

Albumen of six eggs	200 cub. cents.
Distilled water	50 ,,
Grape sugar	6 grammes
Dextrine	6 ,,
Iodide of potassium	1·50 ,,
,, ammonium	1·50 ,,
Bromide of potassium	0·50 ,,
,, ammonium	0·50 ,,

To these are added a few drops of liquid ammonia, and one or two grains of iodine.

The plate is drained at a moderate temperature of between 15° to 25° Cent. It is then sensitized in—

The Silver Bath.

Distilled water	100 cub. cents.
Crystallized or fused nitrate of silver...	6 to 8 grammes
Glacial acetic acid ...	8 to 10 ,,

The plate is then washed in rain-water, the latter being afterwards employed for development, and then the plate is allowed to dry in the dark.

The Exposure must be calculated at the rate of one minute for every eight centimetres of focus, for a landscape lens with small diaphragm.

The Development.—The plate is put for a few minutes in the water preserved from the preparation of the plates (see above), and then immersed in the developer, the following being sufficient for a quarter-plate negative:—

Gallic acid (4 per cent.) ...	20 cub. cents.
Pure rain water	20 ,,
Acetate or phosphate of soda (5 per cent.)	5 grammes

If the development does not proceed quickly as could be wished, add a few drops of—

Very pure fused nitrate of silver	2 grammes
Distilled water	100 cub. cents.

When the details have come out well, the image is intensified slightly by means of—

Pyrogallic acid	1 gramme
Distilled water	250 cub. cents.
Glacial acetic acid	10 to 15 ,,

If the image is grey and vigourless it is intensified with the following solution:—

Pyrogallic acid	1 gramme
Glacial acetic acid	1·50 to 2 grammes
Distilled water	250 cub. cents.

If the cliché lacks detail, put it back into the gallic acid solution containing a little nitrate of silver.

Fixing and Varnishing.—The fixing of the cliché is undertaken with a saturated solution of hyposulphite of soda; and it is varnished with ordinary negative varnish.

Modifications added to the process to render it more certain.—After the sensitizing of the plate and the ordinary washings, I cover the film with a solution of a bromide salt of ·50 per cent strength; I wash again, and then immerse into a bath of pure water containing a few drops of an alcoholic solution of pyrogallic acid (of two per cent. strength), and a few drops of acetic acid, I wash lightly with the water bottle, and put the plate on the drainer to dry.

When the plates are produced in this way for working dry, not only are they more readily impressed in a feeble light, but they may be kept for an almost indefinite period. Vigorous clichés may be obtained, clear and full of detail in verdure or foliage, in the case of landscape pictures. I also employ with success the following reducing agent:—

Water	250 grammes
Gallic acid	0·8 ,,
Pyrogallic acid	0·3 ,,
Alcohol	5 cub. cents.

When the image has come out under the influence of the developer, I intensify and render apparent the slightest details by means of acetate of lead, adding it to the reducer by drops at a time, together with similar quantities of acetic acid. The cliché exhibits in a few minutes its most minute details; it is then washed and fixed in the ordinary way.

It very often happens that in employing the ordinary reducing agent of gallic acid dissolved in water, the image does not appear, or, if it does, it very soon gets fogged. This is the result of the decomposition of reducing agents in water, and it never takes place when the solvent employed is alcohol, which I therefore strongly recommend as giving the most certain results in the development of dry plates. Moreover, the feeble quantity of alcohol contained in the developing liquid suffices to hinder the appearance of tiny defects by completing the coagulation of the albumen produced by the aceto-nitrate of silver bath.

Distilled or rain water ...	25 cub. cents.
Gallic acid solution, two per cent. strength in alcohol...	55 ,,
Solution of phosphate or acetate of soda, two per cent. strength	3 ,,
Glacial acetic acid	a few drops

The reducing agent may, if it is desired, be rendered more active by adding a few drops of pyrogallic acid solution (in alcohol of two per cent. strength), but it is always preferable to develop the image slowly.

After having poured a sufficient quantity of the reducing agent in a dish, the plate is withdrawn from the dark slide and placed in the liquid. At the end of a few minutes the cliché is washed, and there is added to the bath a few drops of aceto-nitrate of silver of three per cent. strength. The plate is again put into the bath, this time film downwards, kept from touching the bottom by means of two glass slips, care being taken to prevent the formation of any air-bubbles. The operation is then proceeded with in the ordinary manner.

EMULSION WITH BROMIDE OF ZINC.

The following is the formula described by Mr. Henry at the last meeting of the Photographic Society. He said:—

"By the kindness of Herr Warnerke, in furnishing me with his formula for a bromide of zinc emulsion, I have been enabled to make some experiments in the direction of simple washed dry plates; and so far my experience informs me the zinc emulsion promises to give the most rapid and in every way most satisfactory collodion dry plate, the only point yet remaining to be ascertained being its keeping qualities.

"The formula given to me was, for 1 oz. of emulsion:—

Nitrate of silver	17 grs.
Bromide of zinc	9¾ ,,
Aqua regia	2⅓ min.

"By multiplying these amounts we arrive at more workable quantities. Herr Warnerke directed me to add the silver to the collodion first, and allow it to stand for twelve hours or so. But I have found no advantage in this; on the contrary, it is easier to emulsify when the collodion is bromized first. And here I would observe to amateurs like myself, the surest way of getting all the silver into the emulsion is to dissolve it in a clean bottle by the aid of heat, and then pour in the bromized collodion; the act of pouring in thoroughly emulsifies the mixture without the necessity of violent agitation. This emulsion requires to stand for a week or ten days before being used, for the reason that before that time it gives only a thin film, but after the lapse of that time it acquires a very thick and creamy consistency, and is more sensitive.

"The zinc being easily soluble in alcohol, there is no difficulty either in keeping it or in mixing. I have found with this formula a strong disposition to fog, which condition, though balanced by the density afforded by the zinc, is not desirable: this is corrected by the addition of iodine.

"Plates made in this way need neither organifier nor redevelopment to confer density, as may be seen by examining the specimens sent round, which were taken by three seconds' exposure to a gas flame. I have succeeded, as Herr Warnerke and Mr. Nesbit know, in obtaining a thoroughly exposed transparency in one second."

NEW METHOD FOR THE QUANTITATIVE ANALYSIS OF SILVER.*

The method recently proposed by M. J. Volhard is based upon the circumstance that soluble sulphocyanide combinations with acid silver solutions form a white curd-like precipitate of sulphocyanide of silver. The same precipitate of sulphocyanide of silver is also obtained when silver solution is in the presence of the red solution of sulphocyanide of iron, the colour of the latter disappearing instantaneously under the change. If, therefore, a solution of sulphocyanide of potassium or sulphocyanide of ammonium is added, drop by drop, to an acid silver solution, to which some sulphate of iron has also been added, every drop of the sulphocyanide salt solution creates a blood-red cloud, which, however, disappears upon the solution being shaken, the mixture assuming a pure milk-white colour. It is only when all the silver has been precipitated as sulphocyanide of silver that the colour of the iron and cyanide remains. If it is known how much sulphocyanide salt is necessary for the precipitation of a certain amount of silver, then it is easy to ascertain the exact quantity of silver contained in a solution.

This method is capable of being very generally employed, for it permits of bodies—such as chlorine, bromine, and iodine—being quickly and surely determined by precipitating them with silver solution of known strength, the excess of the added silver being titrated back again by means of a solution of sulphocyanide salts. Especially for the determination of the above elements in organic combination is the new process of Volhard to be recommended. The method has many advantages over Mohr's process, in which bichromate of potash is the indicator.

1. It is carried out with an acid solution, while with Mohr's process a neutral fluid is necessary, thus curtailing at once its utility.

2. The combination—the colour of which serves as an indicator—is soluble, so that the retroaction is more easily known.

3. The salt serving as indicator (the sulphate of iron solution) is itself uncoloured, and can therefore be added in larger quantities.

To make his titrating fluid, Volhard employs sulphocyanide of ammonium. As this salt is too hygroscopic, in order to weigh it in particular quantities the solution is put into a silver solution, obtained by dissolving 10 grammes of pure silver in nitric acid, and diluting to 1,000 cubic centimetres. In another vessel a quantity of sulphocyanide of ammonium is dissolved in water, so that 8 grammes are contained in every litre of water. Ten cubic centimetres of the silver solution are put into a beaker, and to it are added 5 cub. cents. of a pure solution of sulphate of iron (a litre containing 50 grammes) together with 150 to 200 cub. cents. of water. From a buvette the sulphocyanide solution is gradually added, agitating the while, until the fluid has attained a feeble red tone. Assuming that for 10 cub. cents. of silver solution 9 6 cub. cents. of sulphocyanide solution have been used, 960 cub. cents. of the latter is diluted to 1,000 cub. cents. One cub. cent. then shows 10 or 10·8 milligrammes.

Before use, this solution is again tested. With this object, 1 gramme of pure silver is weighed, and this is dissolved in 8 to 10 cub. cents. of nitric acid; this is heated upon a sand bath until no further trace of nitrous acid fumes are given off, and to it are then added 5 cub. cents. of iron solution, the whole being diluted subsequently with 200 cub. cents. of water. On cooling, the sulphocyanide salt solution is added, while the liquid is kept agitated. With the last drop of the hundredth cubic centimetre the red colour must have set in visibly and permanently.

SILVER, CHROMIUM, CARBON.

(A Critico-chemical Comparison.)

BY W. HOWARD, ANALYST.

Silver.—*continued.*

What is the nature and ultimate result of the decomposition effected by light in silver salts?

This is one of the questions which must be answered before we can fairly estimate the chances of stability which belong to a silver print.

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* *Dingler's Polytechnisches Journal.*

An examination of the conditions under which the decomposition takes place, together with a reference to those characters of the metal to which I have already adverted, will enable us to grasp a tolerably clear idea of the result. The salts used as sensitive agents in printing are the chloride and nitrate of silver.

If these salts, in a state of purity and absolute dryness, are exposed even for protracted periods of time to sunlight, they do not suffer any determinable change, chemical or physical.

If, however, they are associated with moisture or organic matter, they rapidly blacken; and so photographic proofs are produced by their aid.

To understand the nature of the change which has taken place, let us consider the simplest example, that of silver chloride in contact with moisture. Scheele, a German chemist, settled at Köpnig, in Sweden, made the first recorded philosophical inquiry into this matter. He, after experimenting, declared that the decomposition of silver chloride in the presence of water (or organic matter) was due to the disassociation of chlorine and the formation of hydrochloric acid. This hypothesis has since been fully confirmed and elevated into a known fact. It will be thus easily seen that the action promoted by light is one of reduction. The light in this case plays a part exactly analogous to that which in a preceding paper I noted as being the part played by heat, viz., the reduction of silver chloride by the aid of hydrogen.

The necessary hydrogen is supplied by the water.

Water and light alone will not effect the decomposition of silver nitrate; to do this, organic matter must also be present; this action is more complicated; the nitrate probably (as in the case of albumen) forming in the first instance a compound with the organic matter, this compound being afterwards disassociated by light. As in the instance of the chloride, the result is the reduction or deoxidation of the silver salt, for which the carbon of the organic matter is probably answerable.

In practice, this reduction of the silver-salt, be it chloride or nitrate, never proceeds far enough to produce actual metallic silver, stopping when a subsalt or suboxide is formed. How far the reduction might proceed is a matter of dispute amongst chemists of the highest standing, and I would feel much diffidence in advancing a dogmatic statement regarding such a delicate chemical problem. It does, however, seem to me (remembering how easily the silver oxides are perfectly reduced by heat alone) that no violation of possibility is made in presuming that in the presence of organic matter capable of assimilating oxygen, and also of furnishing hydrogen to unite with chlorine, a positive and complete reduction of nitrate and chloride of silver might, if the action of light were long continued, be effected.

The solubility of the agents employed is also a matter which largely affects the result of silver printing when its stability is in question.

Chloride of silver, and also the compound which the nitrate forms with albumen, are both insoluble in water; and strong mineral acids being on the one hand ineffective, and on the other inadmissible because of their destructive powers, we have to employ other agents to dissolve the undecomposed silver compounds, or by a continuance of the process of reduction the image obtained would be obliterated.

Chlorides have been used for this purpose, but their action being slow and imperfect, they have long been discarded in favour of soda hyposulphite. This salt, as is well known, plays a double part in fixation. In the first place, there is a simple interchange of bases, the silver being converted into hyposulphite, and the soda into chloride.

This hyposulphite of silver is very sparingly soluble in water, and it is only after the formation of a double hyposulphite of silver and soda, by the action of a fresh portion of the fixing solution, that a fairly soluble compound is obtained.

The hyposulphite also forms this soluble double salt with the silver existing in combination with the albumen *where the light has not acted.*

It is, however, nearly impossible to remove all the surplus silver by the action of hypo. This may be traced to two causes:—

1st. On proceeding to wash the prints, for the purpose of eliminating the hyposulphites, it is highly probable that this double salt is partially decomposed, and some silver hyposulphite (by reason of its small solubility) is left in the print. This view gains much force from the almost unvarying presence of hyposulphites in silver prints, however carefully prepared; indeed, the total and unvarying expulsion of hypo is *practically* impossible.

2nd. Dr. Van Monckhoven has asserted, and Mr. E. J. Reynolds has confirmed his assertion, that chloride of silver forms with albumen a distinct chemical compound, which is sensitive to the action of light; but which, by the action of soda hyposulphite, has the chlorine removed, and the silver converted into an oxide by the decomposition of an atom of water, and that this oxide of silver is left in combination with the albumen.

"But" (says some sturdy champion of silver printing) "my dear sir, you are entirely ignoring the fact that we tone our silver pictures and convert them into golden ones." To such a one I reply, "Wait, my friend, for a few moments." I have so far omitted any reference to toning, because I wanted to show that a silver picture, pure and simple, may easily contain more silver than is employed in forming the image, and some of that surplus silver in a deleterious form. Of course, even admitting the *possibility* of removing all the hyposulphites from the picture, leaving us with an image consisting entirely of suboxide or oxide of silver, no one would contend for a moment that it had a chance of more than an ephemeral duration. This has been long recognized, and gold toning is the accepted method of conferring stability on a silver print. Were gold toning accompanied by a perfect substitution of the metal used for the one which it is designed to replace, then silver printing would have no need to fear rivalry, at least not on the score of permanency. Such a perfect substitution does not take place, as the classic researches of Messrs. Davanne and Girard have fully demonstrated. These researches, which were very lengthy and elaborate, should be read by every one interested in the cause of *chromium* versus *silver.* They were published in the English photographic papers of the year 1864. One result obtained by them I shall quote, and it is a fair average of the whole series of their experiments.

Taking prints on plain paper, which were well fixed and washed, and then toning them for the unusually long period of thirty hours, these gentlemen found that at least one-quarter or one-fifth of the silver which composed the *fixed* image remained in the finished print. This is not a specially high result; in fact, in the case of albumenized prints they discovered much more silver was left in the finished picture. Malgre imperfect fixation, or bad washing, the gold-toned print contains invariably a large amount of silver existing as oxide or suboxide, in which state it easily forms those compounds that are the cause of fading.

(To be continued.)

NOTE ON SILVER PRINTING.

BY LEOPOLD BACHRICH.*

Among the acute defects which trouble silver printers are the dull spots, or pock marks, as they are frequently termed, so often observed upon brilliant albumenized papers after printing. During the process of washing the pictures, or even before, while they are being fixed, there appear tiny blisters, often assuming the size of a pea, which are filled with water. These by themselves injure the prints little, as, when dry, the blisters become again perfectly flat; but if the paper is left too long in the water, the spots assume a bluish tone, and thus the picture is rendered useless. Many overcome the difficulty altogether by abandoning brilliant paper, and having recourse to that which is less thickly albumenized, and which has not, therefore, the same tendency to become blistered.

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* *Photographische Correspondenz.*

If, however, we desire to get the better of blisters, it is necessary to be rigorously careful in our work, and, indeed, have recourse to that attention and caution without which a favourable result is impossible in photography.

I have found that the difference in the temperature of the various liquids which are employed in the production of silver prints has a very great influence indeed upon the formation of these blisters and spots, and, as the difference in temperature is more varied in winter, it is for this reason that such faults are more frequently met with at that time of the year than any other. It is necessary, therefore, that the temperature of all liquids, not excepting the water employed for washing, should be as nearly as possible the same. Water and hyposulphite solution are in winter known to be extraordinarily cold, while the gold bath, in order that it may tone the quicker, is frequently warmed. In this way the temperature between the toning bath and the soda solution and the water is made greater still, and thus the liability to the formation of the defects in question considerably increased. The warming of the toning bath should, therefore, not be undertaken, but a more rapid toning of the pictures brought about instead, by adding an increased quantity of gold; on the other hand, the temperature of the soda bath, as also that of the washing water, may be raised with advantage. Great caution is, however, necessary in doing this, for if the soda solution is used too warm and the water also, the brownish tone of the pictures is easily transformed into an unpleasant yellow. By an approximation of temperatures in this way, however, the hyposulphite of soda is now completely and surely removed.

Various kinds of papers naturally give various results, and it not unfrequently happens in practice, that one photographer will obtain good pictures with one kind of paper, while the same material will only yield failures in the hands of another. It is, however, the rule with photographers to ascribe failures not to any fault of their own, but to the material with which they are working, and it happens not unfrequently, therefore, that a very good and serviceable paper is declared to be good for nothing, simply because it has not yielded excellent results at the very first trial. Photographers will do well to devote themselves always to one and the same class of paper, and to conduct their manipulations in such a way as to produce the best pictures with that particular kind. Every kind of paper, in my experience, requires special treatment and special study, and it is only by paying attention to the individual properties of a paper that the finest pictures are secured. In conclusion, I am of course quite willing to admit that at times perfectly unserviceable paper does find its way into the market.

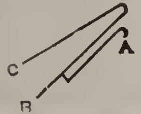
Correspondence.

SYPHONS, PRINTING, ETC.

Dear Sir,—I hope you will allow me sufficient space to express a word of thanks to the gentleman who signs himself "E. L." I had prepared an answer on the 25th ult. to Mr. F. W. Hart, but I thought better. It was clear to any one that my letter of the 11th ult. was through a good feeling towards my fellow workers, rather than a presumptuous pride, and I found very harsh and discouraging the remarks of his, and really I am very pleased with Mr. E. L.'s. observations. *Apropos*, I will say that the use of carbonate of ammonia I found superfluous, but give to the prints a thorough good washing and a bit of elbow grease, and I quite agree with the conclusion of Mr. Russell Sedgfield, although, as I am a practical printer, I must say that the faults do not always lie with the workmen. There are many masters who pretend a great deal of the printer. Generally printers are the worst paid in a firm, and exposed to the bitterness of the weather, and often receive some bad negatives, and must repair the faults of the operator; if not, he gets a blowing up, and there is the poor man pining in some solitary part of the building, working very hard, and thus making him careless.

I have seen many printers very dirty and careless. I saw in some printing places, figures, caricatures, and many designs on the wall, even on the ceiling, done with the fingers dipped in the nitrate of silver. I have seen them fixing with one hand, and toning with the other, and half of their prints were torn, stained, or spotted with hypo. I once made some remarks to a man, and he replied to me, "How can I do different? I received to-day the negatives of a family who are going the day after to-morrow to India, and I received the order to get as many as possible for to-morrow morning. I have also many behind from last week, through its being wet, and nobody to help me. I must do the best I can." I couldn't blame him. Another man told me, "I have to deliver nearly every day some prints by such and such a post, through the carelessness of the operator, who forgets to send me up the same order, and when the parties write about it, I have the negatives sent to me in a hurry, and deliver the prints without having sufficient washing." Can these be permanent? Undoubtedly not.

En passant, I have seen a great deal since the 4th ult. about syphons, and I thought it hardly worth while to discuss it, although much has been said about it since, and I can see that what suits one does not suit another; and that is clear enough. I myself changed many plans according to circumstances; for instance, ten years ago I had, being in Alexandria, to go and photograph the Pompeii Column. I had then a 12 by 10 perpendicular dish without spout or lip, but I used a syphon, and, moreover, this dish had not an hermetical lid. In placing my box and tent over the "Hamar," the trotting of the Arab animal broke my syphon; so after I took my negatives, I could not pour my silver solution into the bottle again; hence a considerable loss of fluid.



I now use a double sheet dish, which is of course very heavy and large. I use from 50 to 60 ounces of fluid, and I sensitize two sheets at the time. It would be impossible for any one to pour off the solution without the aid of a syphon. I use a very cheap one with a mouth piece; it cost 6d. Many do not like to use it, for fear of getting "sucked in," but I will now describe to you how I manage it, and I assure you I never had a drop in my mouth. The end A I put in my mouth, covering the end B. I blow through C, and then, covering the end C, I blow through B; thus making it free from bubble or fluid that could have remained in from the previous operation. I then let all the fluid run in one corner of the dish, and place the end of the syphon C in the silver solution, the end A in my mouth, and cover, with the first finger of the right hand, the end B, and begin to draw the fluid up the syphon, having of course a bottle in my left hand, and as soon as I see and feel the fluid arriving and touching my first finger at the end B, I let it go, and the solution flows even till the last drop. I then take about 20 ounces of distilled water, pour into the dish, rinse it well, and syphon it into another bottle, and when I make a fresh solution I take this water, already 3 per cent. strong, with some more crystals of silver, and so I have a stock to reinforce the bath without losing a minimum of silver.

Gustavo.

SUBSTITUTE FOR GROUND GLASS.

DEAR SIR,—On reading Mr. Martin's letter in your last, I was induced to experiment with the imitation of ground glass, described by me in your issue of March 3rd, in order to ascertain the degree of heat it would stand without injury to the surface; I also tried adding a few drops of water to white hard varnish, as suggested by Mr. Martin.

To determine the degree of heat the substitute for ground glass would sustain uninjured, I prepared two plates, and subjected one to 120°, and the other to 100°; each remained five minutes in their respective degree of heat; the former (120°) lost a great deal of the beauty of its matt surface, while the other remained unaltered; but to be quite sure, I allowed it to remain ten minutes longer in its place, and when examined it was quite as perfect as before. Mr. Martin is mistaken in supposing the surface consists of resin, the quantity of which is so small that, if the finger is rubbed in a small portion of the powder and lightly dusted off, that which remains on the finger will be found sufficient to grind the surface of *any sized plate*, the resin simply serving as a kind of rasp to grind off the outer surface of the lac of which the varnish is made; and when the plate is finished, there will be found much more powder on the finger than when first applied. As I said in my last letter, I have used it for twelve months, and am quite satisfied that it is quite suitable for all ordinary photographic work in this climate. I have one in use now, which I used for my out-door work all last summer, and it is as good as when first made; but supposing by any accident the focussing screen should get near the fire, and lose its matt surface, it can be restored immediately by applying the resin as described.

To carry out Mr. Martin's suggestion, I proceeded as follows:—To an ounce of varnish were added six drops of water, and after being shaken, and allowed to settle, a plate was coated, and allowed to dry without heat; the result was uneven and coarse, quite unfit for focussing; by the appearance of the plate I concluded there had been too much water added. I then diluted the varnish in which the water had been mixed with half its bulk of ordinary, coated a plate, and the result was little better than before; again I added half an ounce of ordinary varnish, making in all, varnish two ounces, water six drops, and on coating a plate, the result was similar to the last; accordingly I gave it up as useless.

I have sent you one plate, which has been subjected to 120° of heat, with half its surface restored, and three smaller pieces of glass prepared with the varnish to which water was added, the result of my experiments. I beg to apologize for occupying so much of your valuable space, and remain yours, &c., WALTER GARDNER.

P.S.—I ought to have mentioned I varnished one with the varnish to which water was added, and dried by heat, the result of which was the ordinary glossy surface.

March 27th. W. G.

[The examples enclosed fully bear out our correspondent's remarks.—ED.]

Proceedings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL MEETING of this Society was held on the 22nd inst., SIR ANTONIO BRADY in the chair. The minutes of the previous meeting having been read and confirmed, the following members were elected:—S. G. Fairtlough, Esq., R.A.; W. H. Danby, Esq.; Major C. Warde; J. S. Milner, Esq.; Miss E. A. Fazarkerley.

The SECRETARY laid before the Council a letter from Mr. J. C. Stenning respecting the retention by the Society of the prize negatives, but the subject being important, and the Council being most anxious to meet the wishes of many members, it was deferred for final decision to the next Council Meeting.

Mr. GLAISHER then proposed that copies of the prize pictures for the past year should be exhibited at the next meeting of the Photographic Society. This, after being seconded by Mr. Sopwith, was decided by the meeting.

A. J. MELHUISH, Hon. Sec.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Tuesday evening, the 28th inst, at the Free Public Library—the President, Mr. W. Atkins, in the chair.

The minutes of the previous meeting were read and passed.

Mr. J. A. T. ELLERBECK's proposal was adopted: "That a collection of lantern slides presented by the members should be made by the association, the members to have the use of the same on application to the secretary."

The Rev. H. J. PALMER exhibited a number of negatives prepared by dissolving Kennett's pellicle in mild beer instead of water. The negatives were of various sizes, from quarter-plate to 7 by 9. All the negatives were of sufficient density, which had been obtained without any after-intensification. Mr. Palmer also exhibited a large group on a 7 by 9 pellicle plate, prepared with water a year ago, which had kept well; the exposure was fifteen seconds, Ross's landscape doublet, no sun. Mr. Palmer, in his remarks relative to the gelatino-beer pellicle, stated that, though the pellicle dissolved more slowly in the beer, yet the plates dried more quickly. The emulsion acted more like collodion in flowing easily over the plate, so that large plates could be coated without using a glass rod. These plates were rather slower, but there was more freedom from fog, and more light could therefore be used in the dark room. He (Mr. Palmer) was not sure but that for interior work the pellicle dissolved in water would be preferable, but for outdoor work he certainly preferred that prepared with beer. He had tried to make pellicle with beer, but failed, owing to the silver being thrown down on adding the beer.

Mr. E. ROBERTS thought this might be owing to the presence of salt, which was found in some kinds of beer.

The SECRETARY showed a number of prints from gelatino-beer plates, and stated that he found no difficulty in getting any density without after-intensification. There was also more latitude in exposure. He passed round a print which he had taken with an exposure of a minute, with the smallest stop, in so dull a light that with any other process he would not have cared to expose a plate at all. It would be seen that all detail was visible; for out-door work the addition of beer was an improvement.

Mr. W. H. KIRBY exhibited some Liverpool plates, which he had sent out to the Cape of Good Hope to be exposed. They were developed when he received them back twelve months after exposure, and were satisfactory. He also exhibited a portrait taken instantaneously on a wet emulsion plate by the light of one of Mr. W. Keith's lighting powders.

The following were passed round for inspection, with thanks to the donor:—The last number of the *Bulletin Belge; Aide-Memoire Photographic* for 1876, by M. C. Fabre, of Toulouse; and the *Agenda Photographic*, from M. Leon Vidal.

The meeting was shortly afterwards adjourned.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next meeting of this Society will take place on Tuesday next, April 4th (instead of the usual second Tuesday), when a description of an entirely new system of photography, communicated to Mr. John Spiller, F.C.S., will be given, and some illustrations of the process shown.

A DEMON LENS.—A correspondent of *Anthony's Photographic Bulletin* sends to the office an extraordinary lens possessed of some strangely malignant qualities. The writer says:—"Gentlemen,—I send you by express to-day (paid) one lens which I bought four years from——. It is the most depraved specimen of lenshood that I ever encountered. I believe Old Nick himself helped to make it. I am afraid of it. It's a weird thing of evil. I can't look at it without swearing. It's the most certain incentive to profanity I ever heard of. I never can do the subject justice myself, and always have to hire the street-boys to help me 'cuss' it when using, or trying to use, it. This lens, I fear, will be the means of the eternal loss of one two hundred and ten pound angel in heaven, if I keep it. Slow? Well, you know the photographic world has not heard from me for several years. The fact is, I have been trying this lens, and have not yet had time for a long enough exposure. I have to expose with this lens in winter entirely, because in summer the trees grow so much between the opening of the camera and the closing that the picture is spoiled. Then I have great trouble to prevent people going on with improvements, building houses, &c., in the field of my landscape. Last season I was taking a picture of a church, and went out of town for a few weeks, having built the usual fence around my camera, and told my men to visit it daily during my absence; and when I came back, I found the church burned up, and on developing my plate I had only a faint 'ghost' of a very transparent edifice, through which you looked at a pig-pen and a saloon which stood in the back street. Now there's no fun photographing like that. It's too slow and uncertain. When an amateur has waited a whole season for one plate to expose, it is very discouraging to find that the pendulumic motion of the earth on its axis has displaced his whole picture. I want you to take this lens. I don't want any pay for it, nor allowance. But if you have a bitter enemy that you want to kill, morally and physically, give him this lens. Send it to him with a request for him to try it. It has got a ghost in the middle of the plate. It will speck with the best collodion ever made. It only covers a field three inches in diameter with sharpness. (It was warranted to cover a 4-4 plate). It has—Well!!—It will eternally damn the future prospects of the angel Gabriel. Since I've had this lens I've been elected an honorary member of Hook and Ladder Company No. 2, and president of a bass-ball club, solely owing to the accomplished profanity I have acquired while photographing. I had thought of burying the weird and fearful thing deep, deep in the ground, and building a church over the spot, but I concluded to send it to you; not that I have any personal grudge against you, but you may be able to find out who made it, and give it to him. It is packed in a box with a hole left in the cover to give it air. Open it very carefully, for you may burn your fingers, or set fire to something. It is red-hot usually. If any of your men are church members, warn them away, for the very sight of it has almost depleted the 1st Congregational here, and the attempted use of it in my case has limited my church-going to the poorhouse once a Sunday, where I have to hire a Universalist parson to preach specially."

To Correspondents.

Experimenter.—If you have a glass-cutter in your town, he can level the top of your glass bath, but we doubt whether you can, with any advantage, attempt such a thing yourself. It must be ground level, and this is an operation demanding skill and experience. 2. Dry and clean the zinc, then very thoroughly varnish it.

Pyro.—There are various modes of checking over intensity. The use of a new collodion you have tried; diluting with plain collodion will help you; or the addition of a little bromide of cadmium, about one grain to each ounce, will be useful. Allowing the plate to remain a little longer than usual in the silver bath will often lower intensity. The use of a strong iron developer will check intensity, as will also pouring the developer on the plate with a dash, so as to drive off its surface some of the free nitrate. 2. In plates preserved with glycerine, there is not unfrequently a tendency to fog a little, depending somewhat on the condition of the bath, and somewhat on the quality of the glycerine. But the fog on the sample sent is chiefly due to the light entering through window opposite lens. 3 The examples of portraiture are all pretty good. There is a slight tendency to a somewhat too even diffusion of light over the face; a little more marked light and shadow would give a little more force and relief. But we should regard the examples, on the whole, as a somewhat high-class average.

H. H. Puntan.—The price of the stamp to an amateur's licence for working the Autotype process is 5s

H. F. N.—Beaufoy's acid is one-third of the strength of the glacial. Use one drachm of glacial acid whenever three of Beaufoy's are indicated.

F. G. W.—Your request for a formula to produce enamelled photographs is somewhat indefinite. Do you mean photographs in a vitreous or enamel substance, or paper prints finished with what is called an enamel surface? In either case, the formulæ would be too long for insertion in this column, and we should have to refer you to previous published articles. In our past volumes, and in all our Year-Books almost, you will find details. In our last Year-Book you will find instructions for enamelling prints.

P. Rolls.—The address is 13, Cross Street, Hatton Garden.

John Williams.—The primary cause of the defect of which you speak is pouring the developer somewhat forcibly on one place, instead of throwing it lightly in an even wave all over the plate. Some samples of collodion much more readily yield thin spots under such circumstances than others.

S. B. Matthews.—The plates are albumenized first with a solution containing the white of one egg in a quart of water. The solution does not require filtering. A 35-grain bath in good working condition. Bitter beer is used. An ordinary alkaline developer may be used. You will find Captain Abney's formula in our Year-Book for 1874; and in our volume for last year there are several articles on the subject. 2. The thickness of the sheet india-rubber for lining a bath is about one-twentieth of an inch. It need not be cemented to the wood: but such cementing will do no harm. Chloroform or bisulphide of carbon will dissolve india-rubber. Some samples of benzole answer, but not all.

S. W. J.—The formula for producing enlargements on opal glass is precisely the same as that for producing photo-crayons, and you will find several articles on the subject in our Year-Books for 1870 and 1871. The negative collodion of to-day is very much similar to the negative collodion of a dozen years or more ago.

Frank Nairn.—The Post Office order received. Goods will be duly forwarded. After paying subscriptions due and amount for present year, a balance of 2s. 10d. remains in your favour.

J. Weaver.—Your general plan of studio seems to be pretty good; but some modifications are desirable. The height of the ridge should be greater; the slope is insufficient. The height of the ridge should not be less than twelve feet, and the width should, if possible, be greater. Both ends should be opaque. The north side may be glass to within eighteen inches of the ground, and about four or five feet at each end opaque. We should prefer to have about six or eight feet of the south side glazed. This could be covered with blinds in sunny weather, but would be useful in dull weather. If you get our Year-Books for the last two or three years, you will find all the formulæ you require. We have no arrangements for answering questions on photographic subjects by private letters. They do not, indeed, come under our attention until the whole are answered together in the columns of the News.

X. Y. Z.—Your question is one for a lawyer to answer. We think it is very probable that the law will provide a remedy for such a manifest grievance; but we cannot say with certainty.

T.—We do not know the method employed by the photographer of whom you speak; but there are several methods in which no film is left on the wood. One of the best is to make a photo-lithographic or photo-collographic transfer, which, being placed on the wood and carefully rubbed down, gives an image in printing ink, and causes no trouble either in submitting the wood to solutions, or in cutting. Another plan is that of Herr Grune, in which a collodion transparency is thoroughly toned with platinum. The platinum image being laid face down on a wood block, which has been moistened with sugar and water, adheres to the surface. In some cases the dried collodion film is removed by means of ether and alcohol, and in some cases, if the collodion be tough, will peel away, leaving a delicate image of platinum black behind. Very few photographers have given much attention to the methods of photographing on wood, and, of course, some experience is necessary to success, whatever the method.

W. H. M. asks if any photographer can furnish him with practical information as to the best system to be adopted in building a substantial studio of a portable nature—whether in sections, and if so, the dimension of same.

R. Bailey.—In the course of a few months' careful practice you might succeed. The chances you describe certainly seem promising.

Staff-Sergeant Perry.—In our next.

W. M. Ayres.—In our next.

S. G. Payne.—Received. Many thanks. The matter shall have full attention in our next.

Several Correspondents in our next.

Advertisements and communications for the Publishers should be forwarded to the Photographic News Office, 15, Gough Square, Fleet Street.

The Photographic News, April 7, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Candidates for the Royal Society.—Mr. Siemens' New Sounding Instrument.

The Candidates for the Royal Society.—Fifty candidates compete this year for the blue riband of Science, the Fellowship of the Royal Society. For some time past it has been customary to elect but fifteen fellows every year, and the consequence is that there is always a keen competition for the honours. This year there are a few less candidates than usual, in some years as many as sixty names being put before the Council of the Society to select from; for in the Royal Society—as in the case of every other learned society in London—the Council have most extensive powers, and in this particular instance are invested with the right of recommending those among the candidates whom they think fit to be elected, a step that is, in fact, tantamount to their election. The Fellows of the Royal Society themselves, it is true, elect the candidates, but as it is very certain that no one not selected by the Council has the slightest chance of being chosen, this actual election by the Fellows is simply nominal. Therefore, directly the Council has made known its choice, and long before the actual election takes place, the public know very well whom the fortunate men are who will be ultimately entitled to write F.R.S. after their names. This year, as we have said, there are fifty candidates for the fifteen honours, and among them are several known in the photographic world. First and foremost comes Captain Abney, R.E., of Chatham, whose chance of election, it is whispered, is very good indeed, his claims for the honour being far greater than many of the candidates. Irrespective of the valuable contributions he has made to photographic chemistry during the term of office as Instructor in Chemistry and Photography at the Royal Engineer Establishment at Chatham, the services he rendered in maturing the preparations for observing the Transit of Venus, alone, entitle him to consideration by the scientific world. For nine months he superintended the photographic education of those who were to act as photographic observers all the world over, and when he had finished his labours in this direction he packed up his own apparatus and went off himself to observe the phenomenon in Egypt, being in charge of the station at Thebes during the period of the Transit of Venus. Another gentleman who appears among the candidates is not unknown to photographers: Mr. G. J. Symonds, the secretary to the Meteorological Society, is a name almost as familiar in connection with weather records as that of Mr. James Glaisher, F.R.S., the president of the Photographic Society. Dr. Armstrong, the secretary of the Chemical Society, is another candidate, and Mr. T. E. Thorpe, professor of chemistry, at Leeds, who has made some investigations upon the chemical intensity of sunlight, is another. Dr. Attfield, well.known in connection with pharmaceutical chemistry, and Mr. Edward Dunkin, one of the most important officials at the Greenwich Observatory, are also upon the list. The names of those gentlemen whom the Council of the Society deem most worthy of the honour will be published very shortly.

Mr. Siemens' New Sounding Instrument.—We shall make no apology for introducing to our readers the new instrument of Mr. C. W. Siemens, F.R.S., which that gentlemen has just brought before the Royal Society, and which divides with Mr. Crookes' radiometer the honour of being the most beautiful and ingenious scientific invention of the year. There is nothing of a photographic bearing in the Siemens' invention, but nevertheless it is so pretty an application of one of the physical laws, that everyone must feel charmed with it. Mr. Siemens, who is a German electrician, who has settled in England for some time, puts before us an instrument which, as if by magic, can tell you the depth of the sea, if it is merely suspended over the blue expanse. Instead of paying out hundreds of fathoms of line, or heaving the lead at intervals to ascertain the limit of the depths below, the sailor has in future but to suspend the bathometer, as it is called, from the side of the vessel, and the scale on the instrument tells him to within a fathom what the depth is. The late John Brough wrote an interesting little book called "Fairy Tales of Science," and it is in such a work as this, we think, that the bathometer should be described. The idea seems altogether too romantic to be true: that a captain may, in the middle of the Atlantic, without even stopping his vessel, ascertain the depth of the almost fathomless ocean by hanging over the side a Siemens instrument, whose only accomplishment, one would think, would be to reflect itself in the deep blue water below. We think we can convey to our readers in a few words how the instrument acts. It is simply an ingenious application of the law of gravitation. We know that bodies are attracted more to the earth the closer they are to it, and a weight would have more attraction a foot from the earth than it has suspended a thousand feet above it. We can hardly say in strict truth that a pound of mercury weighs heavier on earth than up in a balloon, for everything being affected by gravitation, one's weights and scales would suffer just as much from that cause as the body to be weighed. But supposing we had scales which were unaffected by gravitation, what then? Why in that case it would be possible to record the variations of gravitation that a body is subject to; and this is pretty well what Mr. Siemens has done. He has a column of mercury which represents a weight subject to gravitation, and this weight has a counterbalance consisting of light spiral springs which are unaffected by gravitation. If this instrument is put on the ground, the weight, or mercury, is affected by gravitation to its maximum degree, or, as one might almost say, has attained its maximum weight, and being suspended from the springs or balance already mentioned, it bears upon these with some amount of energy. Raised, however, a mile from the earth, the gravity of the mercury is not so great—it is not so heavy, speaking unscientifically—and consequently there is less strain upon the springs. Now if the reader will only bear in mind this circumstance of variation in gravitation according to the distance which intervenes between the instrument and the earth, it is easy enough to understand how the depth of the sea can be measured. Placed upon the sea-shore, we have a maximum strain upon the springs, and the indicator of the instrument marks O; taken out to sea, where it is a mile deep, or in other words where the earth is a mile underneath the boat and the instrument, the gravity of mercury becomes considerably altered. For it must be borne in mind that water and earth are two totally different bodies, so far as gravitation is concerned, the former being much less dense than the latter; and for this reason a layer of water, even a mile thick, separating the instrument from the earth, as would be the case at sea, does not affect the reading of the instrument. The bathometer, simply by the variation in gravitation that it is subject to, tells the mariner how far off the bottom of the ocean is (or, in other words, how far distant is the earth), and so accurately does it perform the task, that, as we said before, one can measure to within a fathom. In one respect its readings are even better than those secured by the laborious operation of sounding. The line tells one the exact depth below the ship, perhaps of a hole immediately under the vessel, while the bathometer gives the average or mean depth below, and thus ensures a result which would be more valuable when sailing by the chart in thick or hazy weather. In this description of the bathometer we have contented ourselves with giving a mere outline of the principle involved. As most of our readers will be aware, the actual construction of such a delicate instrument, which would be affected by so many influences besides gravitation, necessitates many compensating adjustments in order to give correct readings.

ON PIGMENT NEGATIVES.

BY PROFESSOR VOGEL.*

Communicated from the Photographic Laboratory of the Berlin Royal Industrial College.

At the close of my work upon pigment printing, I have pointed out how much simpler the labours of a carbon printer are when he has reversed negatives at his disposal. The single transfer process, then, suffices for all cases, and this may be conducted much more quickly and conveniently than the silver printing method.

I have also pointed out the way in which reversed negatives may be produced by means of the pigment process, namely, by the development of a pigment negative image (printed from a carbon diapositive), which is transferred from paper to gelatined glass.

Unfortunately, the surface of the paper is not fine enough for such work, and, moreover, the negative upon the gelatine film cannot be further intensified, for if permanganate of potash is employed for such a purpose the whole gelatine film is affected by it.

More quickly and surely will the following process be found to answer. A diapositive is printed, and this is developed upon waxed and collodionized glass, and allowed to dry. After drying, the whole is treated with Grüne's leather collodion:—

Paper pyroxylin	2 parts
Alcohol	50 ,,
Ether	50 ,,
Castor oil	1 part.

With this as thick a film as possible is secured, and as soon as the collodion is set, it is put into cold water. After half-an-hour has elapsed the edge of the film is carefully lifted, or loosened with the fingers, and may then be easily removed from the glass under water.

The best plan is to conduct the operation in a dish which is double as large as the plate. The film image is separated and turned over in the water; then the glass plate is turned round so that the unwaxed surface is uppermost, and this is pushed under the floating film. Two corners of the film are held with the fingers to the corners of the glass plate, and the whole is then lifted out of the water, taking care to prevent the formation of air-bubbles. The film becomes perfectly flat, and attaches itself firmly to the glass plate.

No varnishing is necessary. If the film gets folded in the water from one cause or another, it is soon put straight again by the aid of a camel's hair pencil.

The diapositive thus produced, which has been reversed, yields, on printing under pigment paper, a reversed negative.

If it is desired not to attach the film to glass, but to preserve it, so that it may be printed from both sides, it is to be recommended that before collodionising, the plate should be coated with a one per cent. solution of india rubber in benzole. The film, when separated from the glass, is, in the latter case, carefully dried between sheets of filter-paper.

PHOTO-SPECTRUM OBSERVATIONS IN THE RED SEA.

BY PROF. H. VOGEL.*

A year ago I published some observations upon the fluctuation of the chemical action of the sun's spectrum upon bromide of silver. I had found that under the same, or apparently the same, circumstances, the action of the sun's spectrum varied very much, so that it stretched sometimes more, and sometimes less, towards the violet or ultra-violet, while the intensity of the action of the different colours varied at times very much, and this without any reason being furnished either by the barometer, the psychrometer, or the height of the sun. These observations of mine demonstrated extraordinary changes in the transparency of the atmosphere in regard to the spectrum colours, and a closer investigation of this circumstance appeared to me important enough to constitute it a problem well worth my whole consideration during my journey to the Nicobar Islands, as a member of the English Solar Eclipse Expedition, a year ago.

In my experiments I employed the spectrograph, which I have already described in these columns, and for my work *en voyage* I made use of dry bromide of silver plates tinted with naphthaline red, one drop of the latter in solution to ten cubic centimetres of collodion. The collodion was made up of—

Bromide of cadmium	2 grammes
Alcohol	30 cubic cents.
Normal collodion containing 2 per cent peroxiline...	90 ,,

The bromide was dissolved in the alcohol, and the solution filtered; then the collodion was added.

My plates were prepared in Berlin before my departure; the glass was simply collodionized, sensitized in a silver bath, washed, and dried. They showed considerable sensitiveness for ultra-violet, violet so far as light blue, and for yellow; they were less sensitive to green, and least so for red.

More suitable to my purpose would have been films which were equally sensitive to all the colours of the spectrum, but these I could not then prepare; the time at my disposal was much too short, and the weather too bad for any lengthened experiments.

I took, therefore, the plates I mention as being the best at my disposal; but of the fluctuations of sensitiveness so far as red was concerned they could of course give me no indication whatever. The plates were made up in air-tight packets of six, and six dark slides were taken, so as to be sufficient to exhaust an opened packet at once. The development of the plates was conducted in the cabin, in a wash-hand basin, with alkaline solutions. A very small stock of chemicals, which, together with camera fitted into a box but 1½ cubic feet in capacity, sufficed for the whole of the voyage.

The observations were conducted with much simplicity. I posted myself in the steadiest part of the ship in the sunshine, took my instrument on my lap, and turned it in such a manner towards the sun that the spectroscope threw no shadow around it. In this position an exposure of a minute was given at 7 o'clock, 9 or 10 a.m., and at noon and 2 o'clock, or 3 and 5 p.m.

Rising clouds sometimes caused an alteration in the times of the observations, but the periods were chosen as well as possible so that the sun might be observed when at the same elevation in the morning and afternoon. The change of place in the vessel caused, as a matter of course, errors in time, which were taken into consideration in the daily reckoning of the officers of the ship.

My observations began in mid-sea, on the 23rd of February, at 37°, and stretched to Point de Galle, Ceylon, 6° 49′, on the 13th March. The height of the sun in the corresponding observing times increased, therefore, in a very material degree, and should be seen in the chemical intensity of the spectrum pictures secured. According to Bunsen and Roscoe, the chemical intensity in direct sunlight increases with the height of the orb, and decreases with a rising barometer. This, however, only holds good in the case of a perfectly clear sky, in an ideal state of the weather, such as rarely exists. As a rule, the heavens are partially clouded or covered with a haze of vapour, which materially modifies the transparency of the atmosphere, and by that means the intensity of the sunlight. Of all the bright days that I experienced in the Red Sea there was only one which could be called perfectly clear, for on the other occasions there were vapour masses on the horizon, which visibly weakened the solar light. On the hottest day (the 3rd of March, 1875) the chemical intensity of the sun was also greatest, and as we approached the Indian Ocean, and neared Ceylon, the dulness of the atmosphere became more marked, although one would still have averred that the weather was fine. The slight degree of transparency of the atmosphere was also apparent at night, when, although the heavens were apparently clear, the stars were less brilliant than in Germany, and consequently there was, notwithstanding the greater height of the sun, a less energetic chemical action than in the north.

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* *Photographische Mittheilungen.*

How great is the action of even a very thin layer of vapours may be seen from two observations taken in the Adriatic and Indian Ocean, the first in 37° latitude, and 40·56° of sun's elevation, on the 23rd of February, and the other on the 1st of March, in 27° 42′ latitude, and 49·78° sun's elevation; the former observation taken in clear weather, just before rain; the second in the presence of a very thin vapour envelope, which scarcely altered the colour of the blue sky.

Notwithstanding the great difference in the sun's elevation during the time of the two experiments, the chemical intensity of the light proved to be the same in both instances. At the same time, when the weather was constant, an increase in chemical intensity was observed as the sun rose higher and higher.

Early at seven o'clock there was usually an action in the indigo and blue, most powerful at G, and decreasing towards F and H. On the other hand, there was always a very remarkable action in the yellow, most powerful at D, and very quickly diminishing towards orange, and more gradually towards E in the green. No action of the ultra-violet rays was remarked at this early hour between Brindisi and Ceylon. Only on the 2nd of March (in the Red Sea at 24° 3′ lat.), on the brightest day of the journey, and on the 9th of March (in the Indian Ocean, 11° 5′ lat.), was there any visible action as far as H. As the day went on, the intensity in the indigo increased considerably, and in a lesser degree in the green and yellow. At the same time the ultra-violet rays began to work, and at noon the highest amount of intensity was observed at every point. In the afternoon the action decreased in a similar degree. The intensity in the noon and afternoon increased and decreased in a uniform degree, at any rate between the hours of 9 and 3.

On the other hand, it was nearly always the case that the chemical intensity at 5 in the afternoon was different to that at 7 o'clock in the morning, which does not, in any way, coincide with the general opinion that one can photograph better in the forenoon than in the afternoon. This opinion may have arisen in the atmosphere of towns, where as the day advances the smoke and dust masses materially interfere with the transparency of the air, so far as chemical action is concerned. At sea, where these influences are not at hand, there was a much more vigorous action to be observed at 5 p.m. than at 7 a.m. Thus on the 5th March the action in the blue and indigo at 7 a.m. was equal to 0, whilst at 5 p.m. on the same day it was exceedingly vigorous. On the 4th March the action at noon and afternoon was equal; on the 2nd March the action at 7 a.m. was much in excess of that at 5 p.m.

Very remarkable was the chemical intensity on the 5th March (13° 32′ lat.) during a cloudless sky; on this day the chemical action in the yellow was a very energetic one throughout the day, and was greater than that in the blue and violet; at 7 a.m., indeed, the blue had no action at all. Nevertheless, on this day the transparency of the air for yellow was very great, and for blue and violet very little, the violet improving only in the afternoon. On the 2nd of March, however, during a perfectly clear day in the Red Sea, there was great transparency for all the visible colours of the spectrum. As a general rule the action of the green went parallel with that of the violet and ultra-violet, and if one increased, so did the other.

Observations undertaken at the same time with the barometer and psychrometer did not show that the changing chemical intensity depended in any way upon the pressure of air or vapour. Water in the form of vapour drops, and not as moisture, has the greatest influence upon the transparency of the atmosphere, even when those vapour particles did not mass together in the form of clouds; this phenomenon has the power of influencing to a very great degree the effects of the sun's altitude.

My apparatus was not suitable for the measurement of the chemical intensity of the reflected light from the sky and clouds. It is a known fact that a sky covered with light fleecy clouds yields more chemical action than a blue sky, and, therefore, the diminished intensity of the direct sunlight would, from a photographic point of view, be compensated for by the increased intensity of the reflected light.

NEW PHOSPHIDES OF SILVER, AND A METHOD OF ESTIMATING SILVER QUANTITATIVELY BY MEANS OF PHOSPHORUS.

BY WILLIAM FALKE.[*]

Professor of Natural and Physical Sciences in Manhattan College.

Silver is generally estimated as chloride, and this is a process in which great care is requisite At first it must be precipitated as a chloride and be allowed to settle, then collected upon a filter, and washed very rapidly, to prevent any silver from being reduced by the organic matter of the filter; and, lastly, it must be transferred to a crucible and ignited. This method involves more or less difficulty and loss. After a series of experiments, the following phosphorus method is suggested as superseding the use of a filter, and in which the silver is at once weighed in the metallic state. Into a carefully weighed and dried tube or capsule, the salt of silver (the nitrate) is put, and dissolved in a small quantity of water. Then at least one-fifth of its weight of phosphorus, dissolved in carbon disulphide, is added, and the tube, with its contents, slowly warmed. At first the silver is reduced with some phosphide admixture, then the carbon disulphide evaporates, and, lastly, the water is removed by careful evaporation, so as to prevent any spurting. After the whole is nearly dry, which is generally accomplished in less than half an hour, the tube may be heated for a short time by gradually applying the flame to it. The excess of phosphorus undergoes combustion, and the phosphide also, so that nothing remains in the tube excepting metallic silver and phosphoric oxide, which is dissolved out with some distilled water, and the solution is poured out, as the silver adheres together in a spongy or scaly condition. After washing a few times, by decantation. the tube containing the silver is well dried by semi-ignition, and weighed by subtracting the weight of the tube from the tube and silver, and thus the weight of the silver is known.

A few of very many experiments are given to show how accurate and simple the method is: tube, 7·275 grammes (112·267 grains); silver nitrate, 0·068 gramme (1·049 grains); phosphorus, 0·025 gramme (0·3858 grains); carbon disulphide 0.5 cubic centimeter (0·0305 cubic inch); water, 3·000 cubic centimeters (0·183 cubic inch.)

After analysis: Tube + metallic silver, 7·318 grammes (112·929 grains) — tube, 7·275 grammes (112·267 grains) = silver 0·0430; calculated in the nitrate, 0·0432, showing a difference of only 0·0002 of a grain.

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[*] *Scientific American.*

Another example showed: Silver calculated in nitrate, 0·2617: silver found in nitrate, 0·2615=0·0002.

From this it will be seen that (by simply taking a capsule or tube previously well dried, and adding the salt of silver or its solution, then the phosphorus dissolved in carbon disulphide, and mixing the whole), by careful evaporation, and lastly semi-ignition, then washing out after cooling the phosphoric acid, and again drying, the silver may be weighed and determined.

For descriptions of the few compounds of silver and phosphorus thus far known, which are of a very unsatisfactory nature, on account of the difficulty of the investigations, the reader may see Watt's "Dictionary of Chemistry," volume v., page 303.

ON RETOUCHING PIGMENT PRINTS UPON GLASS.

BY J. SCHNAUSS, OF JENA.*

The improved process of printing in permanent pigments consists, as is well known, in transferring the exposed tissue to a glass surface which has previously been coated with collodion, and if for subsequent removal to paper, with a film of wax also. After the development of the picture by means of hot water, and tanning in the alum solution, the image is left to dry, and before it is transferred a second time it usually requires some little amount of retouching.

Hitherto it has been the practice to recommend oil colour, pencil, or so-called albumen retouching for the purpose, the latter being rendered insoluble, or, in other words, coagulated, in some way. The application and mixture of oil colour is a long operation, and, moreover, the pigment dries slowly; the pencil, again, is apt to scratch and cause the brittle gelatine film to fly. The albumen mixture, too, I have renounced, since I have hit upon a simple plan of retouching which requires no mixing at all, and possesses the same tint as that of the pigment print itself, consisting, as it does, of identically the same material.

My retouching pigment is simply the material of the tissue dissolved in warm water, a bit of the tissue being allowed to soak in a vessel of hot water. As soon as the gelatine pigment has been dissolved in the water the paper is removed. By dilution, any tint, from light to dark, may be secured, all the shades being, of course, of the same tone, a result which would be most difficult to obtain by using any strange colours. An arrangement like a water-bath, having at the top three openings into which fit three little porcelain utensils (evaporating dishes), permits of the manipulations being carried out with great ease. The bath, or boiler, is filled with hot water, which is maintained at an even temperature by means of a spirit lamp underneath, and one of the little dishes filled with the warm gelatine pigment of a thick consistence; a second dish contains hot water, and in the third the pigment is diluted, according to circumstances, by means of a camel's-hair brush.

On applying the pigment to the image upon the glass plate, it is necessary to work somewhat rapidly, especially in the case of thick pigment, which soon sets, while the thinner solution takes a longer time to dry. The glass picture, if not produced upon opal glass, is laid upon a retouching stand, such as that employed for negatives, and white paper is put under it, so that the proper effect of the finished picture may be obtained. The paper must be pressed into direct contact with the glass in order to get this effect, as, if there is any light between, such will not be the case. It is possible, after the retouching has been carried out, and supposing this not to be altogether satisfactory, to modify the effect by means of a brush dipped into warm water, or the pigment may be scattered. With a little attention and practice, large dark surfaces may be retouched; after completion of the picture, it is almost impossible to remove the pigment. Finally, the picture is again dipped into alum to tan the retouching, washed, and subsequently transferred to paper.

It ought not to be difficult to colour the image in the same manner with various pigments mixed with warm gelatine solution, in the same way as the so-called chromo-photographs were produced, in which film pictures were put upon a basis coloured with oil pigments.

The process of retouching in this way is, as will be seen, easily carried out, and it is far from difficult by its means to touch out spots and imperfections upon the pigment film, which are scarcely, if at all, perceptible upon the finished picture. In conclusion, I may express my hope that the beautiful and interesting carbon process will now be adopted on all hands, and in this way soon reach a high pitch of perfection.

SILVER, CHROMIUM, CARBON.

(A Critico-chemical Comparison.)

BY W. HOWARD, ANALYST.

Silver.—*continued.*

And now we arrive at the most important point in the history of a silver print, that is, a consideration of the sources from which fading may accrue. They are:—

1st. Free hyposulphite, left after fixation.

2nd. Sulphuretted hydrogen.	All existing to a greater or less degree in the atmosphere.
3rd. Sulphurous anhydride.	
4th. Moisture.	
5th. Oxygen, or ozone.	

It is almost needless to remark upon the effects of free hypo, the well-known yellowing being due to its decomposition and the consequent formation of silver sulphide. One remark may perhaps not be out of place; I have tested very many prints from various sources, and invariably found hypo to be present. One case now in my mind's eye, is particularly striking. A dozen prints selected at random from the productions of a first-class artist, who was far above the suspicion of careless or slovenly manipulation, gave on analysis a return of hypo sufficient to convert half of the total silver in them into sulphide. So much has been said and written recently about hypo, that it might be inferred that it was the only agent concerned in the destruction of prints. That such is not the case I most emphatically assert; all the agents I have above enumerated are conjointly or separately able to accelerate or cause this calamity. I have recently made a few experiments with all the above agents, and before describing the results, I will summarise my methods of procedure.

Good and well-washed gold-toned prints were taken, and, after having been halved (in order that when the experiments were finished one picture might for comparison present two stages of effect), were submitted, in the first place, to the action of absolutely dry sulphuretted hydrogen for about half an hour. Some of the prints which had been so treated were afterwards exposed to the action of sulphurous anhydride mixed with air and moisture, and also to the action of moist ozonized air, and of simply moist air. They were removed after two, three, and four days, one specimen from each atmosphere for comparison. The temperature during the whole time was kept at about 65 deg. Fah., thus securing, in everything but the quantity of the destructive agent present, conditions not diffreing from those in which photographs are usually placed.

The result with the dry sulphuretted hydrogen was in every case a general change of tone to dirty purple, accompanied by decided yellowing of the whites, thus showing very conclusively the presence of silver in the prints. Davanne and Girard, who made some experiments with this gas, found it could be used to tone without yellowing the whites, but only in the absence of moisture. I have found the absence of moisture must be very complete; in the instance given above, the prints I used were in their ordinary state of dryness, and my gas was perfectly desiccated, and yet yellowing of the whites followed. I afterwards used a few prints which had been dried over sulphuric acid; then indeed, there was only a change of tone produced, and no yellowness of the whites. Immersion in water soon produced the same yellow appearance which had characterized the previous batch.

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* *Photographisches Archiv.*

Nothing more than this gas and moisture seem to be needed to produce the most absolute fading. Some prints thus treated, which were afterwards exposed in moist air, faded to very ugly brownish hue in three days.

By using steam to a print which had been treated with this gas, perfect fading occurred in ten minutes.

Sulphurous anhydride is like sulphuretted hydrogen, insomuch that it does not produce fading when in the dry state. My prints, which had been previously exposed to the sulphurizing effect of the foregoing gas, and were afterwards placed in a moist atmosphere of this sulphurous anhydride, were very decidedly faded in three days. The albumen on these specimens presented a very disorganized appearance, which was probably owing to the formation of sulphuric acid, which would be able to attack it. The formation of sulphuric acid, which occurs when this gas is brought into contact with moisture and air, is worthy of notice, as being a very possible cause in determining the decomposition of hypo in prints which contain that contamination. This gas and sulphuretted hydrogen may, when brought together in moist air, form free hyposulphurous acid, which, of course, would cause fading.

A solution, if strong, of sulphurous anhydride will destroy a sulphurized print very rapidly, in fact, in less than an hour.

It will be seen from my remarks on sulphurous anhydride that I believe that ordinary oxygen acts as a destructive agent by reason of its power of oxidising sulphurous acid into sulphuric acid—thus indirectly determining the disassociation of other sulphur compounds which may exist in the print.

Other theories bearing on the action of oxygen have been advanced, which, for want of evidence, I cannot either confirm or confute.

Ozone, with which my opportunities for experiment have been limited from want of time, does act very powerfully both on prints which have and have not been sulphurized. It causes perfect fading of the former in two or three days, and a decided change of colour (probably by peroxidation of the silver) in the latter, in about the same time.

The first portion of my designed task is now completed, and I hope that those who may still believe that well-finished silver work may claim immunity from this disease of fading, will repeat for themselves some of the simple experiments I have indicated. At the same time let them remember that these gases, though small in quantity, exist almost everywhere, and *must* make their presence evident in a few years.

(To be Continued.)

METEOROLOGICAL SUMMARY, 1875.

TAKEN FROM THE REGISTER OF WM. H. WATSON, F.C.S., F.M.S.

The monthly highest, lowest, and mean temperatures observed at Braystones, near Whitehaven, during the year ending December 31st, 1875, have been as follows:—

1875.	Highest.			Lowest.			Mean.			
	Mornings.	Noons.	Nights.	Mornings.	Noons.	Nights.	Mornings.	Noons.	Nights.	Of all Observations.
January...	48°	50°	48°	28°	32°	30°	42·6°	41·7°	42·2°	43·1°
February.	45	46	45	28	31	29	36·4	40·6	37·1	38·0
March ...	48	51	46	32	38	32	39 3	44·4	39·3	41·0
April ...	56	63	51	40	44	38	47·4	52·0	45 0	48·1
May ...	56	66	60	45	50	46	51·4	56·4	51·1	52·8
June ...	64	72	62	51	53	50	56·5	61·5	55·4	57·8
July ...	66	74	61	50	58	53	57·7	64·0	57 3	59·7
August ...	65	73	65	56	60	55	59·8	64·6	60·3	61·5
September	68·5	73	68	50	56	50	57·0	61·0	56·4	58·1
October ...	59	61	58	38	45	37	47·0	51·0	47·7	48·7
November	49	49	47	27	34	29	39·6	43·0	39·3	40·6
December.	48	50	47	27	31	26	39·6	42·1	40 3	40·6
In the year...	68·5	74	68	27	31	26	47 8	54·2+	47·5	49·3

The highest and lowest readings of the barometer were as follows, not reduced to sea-level:—

1875.	Highest.	Lowest.	Day on which the highest was observed.	Day on which the lowest was observed.
January	30·42	28·65	30th	24th
February	30·35	29·32	16th	24th
March	30·42	29·30	31st	6th
April	30·42	28·90	1st	5th
May...	08·19	29·25	11th	21st
June	30·17	29·00	1st	15th
July...	30·25	29·20	6th	10th
August	30·15	29·45	21st	12th
September ...	30·18	29 10	15th	2nd
October	30·00	28·91	6th	11th
November ...	30·25	29·03	30th	14th
December ...	30·12	29·04	8th	22nd
The Year... ...	30·42	28·65	January 30, Mar. 31, and April 1.	January 24.

The following table gives the number of fair days, number of days on which rain fell, number of fair days bright, and the number of fair days gloomy:—

1875.	Fair Days.	Days on which Rain fell.	Fair Days Bright.	Fair Days Gloomy.
January	5	26	1	4
February	20	8	10	10
March	20	11	12	8
April	23	7	16	7
May	16	15	11	5
June...	15	15	6	9
July...	16	15	10	6
August	16	15	8	8
September ...	13	17	8	5
October	6	25	1	5
November ..	13	17	7	6
December ...	14	17	3	11
The Year ..	177	188	93	84

Comparing the summary with that published in the Photographic News last year, we note that the mean temperature was nearly the same during the two years—1874 and 1875. The mean temperature of December, 1875, however, was considerably higher than the mean of the corresponding month, 1874, thus:—

Mornings... 7·5° | Noons ... 5·2 | Nights ... 7·7

The fair days during 1874 came wonderfully near the same number as in 1875, thus:—

1874 ... ... 176 | 1875 177

In the year 1875, however, the fair days bright only amounted to 93, while in 1874 they numbered 106—a difference of 13.

The Photographic News.

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A NEW METHOD OF PHOTOGRAPHY.

A LARGE assembly of members of the Photographic Society met in the Water Colour Gallery on Tuesday night to hear Mr. Spiller's account of a new photographic process. The general feeling of members at the close of the meeting seemed to partake of the nature of disoppointment: they had heard an interesting and novel scientific fact described; but nothing had been added to their repertoire of available photographic processes. This disappointment was probably due chiefly to the terms in which the paper had been announced, as describing a "New Method of Photography." The description was not really inaccurate; but the terms employed suggested, not unnaturally, a method ready for application. Mr. Spiller probably felt something of this from his opening remarks. Nevertheless, he had a really interesting and novel scientific fact to bring forward, distinctly new photographic agents to describe, and he placed his facts before the meeting with neatness, clearness, and precision.

The discovery is due to Mr. Francis Jones, of Manchester, and consists in the fact that a certain combination of antimony and sulphur is sensitive to sunlight. When antimonietted hydrogen is brought into contact with sulphur in the dark, no reaction takes place between the two bodies; but if they are brought into the presence of sunlight a decomposition ensues, and the orange sulphide of antimony is formed. The application of this fact in producing a printing process was described and illustrated by some prints of fern-leaves. To produce prints, the first step necessary was the preparation of paper, which was treated with a solution of sulphur in bisulphide of carbon. The negative, consisting in this case of fronds of fern, was placed in contact with the face of the paper, the felt of the printing-frame at its back, and the frame closed up and exposed duly to light. In the back of the printing-frame an aperture was made, into which a tube connected with a vessel containing the antimonietted hydrogen was inserted. The gas is immediately diffused through the felt of the printing-frame, and through the prepared paper. In about twenty minutes' exposure to sunlight a picture was produced. The light acting upon the sulphur and gas produced a decomposition in every part to which it had access, and nowhere else. No fixing was required, because, when the print was removed from the pressure frame, and from the action of the antimonietted hydrogen, no sensitive surface remained.

The results shown were well-defined images of fern fronds in white on a background of dull orange, with some slight crude approximation to half tone. Some other examples illustrated the result of attempts which Mr. Spiller had made to tone the images by salts of silver and copper, by which a greyish-purple and a brown were produced. As yet but little had been done to test the full capabilities of the process. Mr. Jones had recently brought the subject under the attention of the Chemical Society, and Mr. Spiller had felt it sufficiently interesting, even in its young, crude state, to bring before the Photographic Society without delay.

What further capabilities the process may possess remain to be ascertained by experiment. In many respects it is novel and distinct in character from any other photographic process. Unlike the iodide of silver processes, it yields no latent image capable of development; unlike the chloride of silver processes, it does not permit of the preparation of a sensitive surface, to be exposed at leisure to the action of light. It rather resembles the favourite lecture experiment to which Mr. Friswell referred, in which a mixture of chlorine and hydrogen remains inactive in a sealed tube or bulb of glass, until it is subjected to the action of light, the impact of which produces an instantaneous explosion. Mr. Spiller believed that the method he described, furnished the only instance in which a gaseous body supplied the sensitizing agent. He probably overlooked for a moment the experiments in heliochromy, in which chlorine was employed in preparing the film of subchloride of silver, and the closely analogous operations in the Daguerreotype process, in which iodine and bromine in a state of vapour, nearly allied to chlorine in the state of gas, were used to prepare the sensitive surface of iodide and bromide of silver.

Mr. Spencer pointed out that better results than those exhibited might probably be obtained by securing on the paper a finer coating of sulphur. The specimens in hand had a crystalline surface; but it would be possible, by more than one method, to secure a much finer surface. Mr. Spiller exhibited samples of toning, scarcely promising in colour, it is true, and in one case involving the use of silver and hyposulphite of soda; but the possibility of modifying the undesirable dull scarlet or orange tint was thus shown. On the whole, perhaps, it would be too much to hope that any new practical process of value will issue from the novelty introduced; but it is difficult to place limits to the possibilities of such discoveries, now certainly interesting, in the future possibly important.

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ECHOES OF THE MONTH.

BY AN OLD PHOTOGRAPHER.

Silver Printing v. Carbon—Photo-Polychromes—Emulsions in the Studio—Photographs in Sulphide of Antimony.

Silver Printing v. *Carbon.*—The photographic question of the day of vital concern to all who depend for income upon the practice of photography is, unquestionably, whether silver printing shall really and rapidly be superseded by carbon, or not. Few people doubt, probably, that carbon will eventually largely, if not altogether, supersede silver printing; but the important questions of to-day are whether carbon is yet sufficiently perfect and easy to be universally adopted, and whether silver printing is necessarily so unstable that it should be abandoned by self-respecting photographers. The latter question touches professional photographers most nearly. The one serious and distressing fact which weighs on the minds of many is that prints, instead of being more permanent, have been less stable of late years. This clearly should not be so. The argument in favour of silver prints is a very clear and simple one, and stands thus: some silver prints remain permanent; such permanency is therefore possible, and all silver prints ought to be made permanent. Why are they not so? The causes are not easy to determine; but there is, I think, one very important one which is often overlooked. Of late years prints have been produced in much larger quantities than they were at one time, and receive attention in a much more wholesale fashion, and hence, it is probable that many of the individual prints receive less care than they used to receive, both in fixing and washing, than they did when fewer were produced. I believe that it might be possible to guarantee a reasonable degree of stability to one or a dozen silver prints, if they were fixed individually in fresh hypo, and washed individually with a sponge, or other mechanical aid, thoroughly. But where a few hundred prints are fixed together, some of them sticking together, some of them being placed in the hypo after it has fixed many prints and is getting exhausted, and when these prints, after receiving a few slight changes of water, are thrown into a washing machine where they are immersed for many hours, during the first few of which they are subject to the action of what is practically a very dilute hypo bath, it is no wonder that many of them fade. It is scarcely possible to suppose that prints are treated in this fashion in the establishments of men like Robinson and Mayland; but they cannot personally superintend all the printing operations in their establishment, and may be occasionally victims of careless assistants. The common if not universal use of stale albumen is another fatal, but preventible, cause of fading. Albumenizers are most concerned in maintaining the status of silver printing; they are, naturally, the keenest opponents of carbon, and yet they have been doing much to aid its progress, by the use of stale albumen. Many of them know it is probable that it is not conducive to permanency; but, they say, photographers demand a surface which can only be obtained by stale albumen, and they yield to the demand. In the old time, albumen was used to modify the surface of the paper, and white of egg diluted in various degrees with water was employed. Now, double albumenized paper is not too glossy for many tastes, and the increased quantity of an undoubted element of instability is universally used. The two causes of fading I have named are generally admitted as conducive to fading, and they are preventible causes. To all concerned I would simply say, *verbum sap.*

Carbon printing is undoubtedly progressing; but there is one cause which is calculated seriously to retard its progress: I hear on all hands, from those experimenting with the permanent process, of the difficulty of obtaining anything like uniformity in the quality of the tissue supplied. One batch will yield excellent results, and the next nothing but reticulation: one batch gives brilliant prints, and the next, flat poor pictures. As the company have the monopoly of manufacture, the photographer cannot do as is his wont with other material, when he is disappointed, change to another maker, and the disappointment and annoyance must be borne, or the effort to produce carbon prints given up. I have heard of cases where the latter plan has been adopted. To those concerned in this matter, I would also say, *verbum sap.*

Photo-Polychromes. — We have heard from time to time of the wonderful progress made by M. Vidal in his process of producing carbon photographs in colours. The method he described years ago consisted in printing different parts of a negative—the rest being blocked or masked out—on a tissue of its proper colour, all the portions being eventually transferred, each to its proper place, on one picture. The process was manifestly ingenious, but not less clearly tedious It was rather surprising to hear from time to time accounts of the polychromes produced in large numbers on a commercial scale. It seemed odd that examples did not seem to reach this country. I learn, however, from a friend who has recently visited Paris, that the early process of Vidal is not employed in producing the present commercial work, but for producing varied tints, something more analogous to chromo-lithography, upon which a carbon image is super-imposed. The result is described as in some cases pretty, and in some only commonplace.

Emulsions in the Studio. — Readers of photographic journals might easily imagine that the use of emulsions in place of the ordinary wet collodion process had become common amongst photographers, from the space they seem to occupy in the interest of experimentalists. There can be no doubt that they do possess a fascinating interest to the scientific experimentalists, as the recent papers of Colonel Wortley and Herr Warnerke illustrate. But I should be greatly obliged to any of your readers if they can tell me of any case in which they have been applied to studio work in place of the wet process. From many of the articles written, it would seem that the plates equal, or surpass, in sensitiveness those prepared by wet collodion, and they should possess great advantages for studio work. Have they been in any case adopted for such work?

Photographs in Sulphide of Antimony.—The pretty novelty introduced to the Photographic Society by Mr. Spiller as a new method of photography will not, I imagine, peril the existence of any photographic method already in existence. I do not know who is answerable for the terms in which it was announced; but these had manifestly excited considerable interest, and drawn together an unusually full attendance of members. As an unfamiliar reaction, the matter really possessed interest; but the disproportion between the process and the title rather provokes allusion to the parturient mountain. Silhouettes in brick red are not tempting, nor is the generation and diffusion through the printing frame during the process of printing of a poisonous gas an attraction. Every ascertained instance of sensitiveness to light possesses interest for photographers, and the discovery of a new fact or operation, in which light plays such an important part, legitimately comes under discussion at a photographic meeting.

The discussion on the subject was not brilliant, but became lively when Mr. Hooper rose to denounce things in general. He denounced a new process of which sulphur was the basis, after photographers had suffered so much from sulphur: he denounced excess of albumen, as vulgar in effect and contributory to instability: and he raised a hearty laugh when he promised shortly, possibly by June, to introduce to the Society prints free from the vulgar gloss of albumen, and at least as good and permanent as carbon. The laugh was renewed when Mr. Glaisher begged him not to delay later than June, lest the Society should have forgotten all about it. Although Mr. Hooper often raises a laugh by a certain persistent and naive audacity, he very frequently hits the right nail on the head, and says something worthy of attention and remembrance.

The Societies generally have been interesting, but novelties have not been rife.

FRENCH CORRESPONDENCE.

M. de Courten's Process of Intensifying — Jules Girard's Microscopic Researches on Collodion—The Sensitizing Process under the Microscope—Death of M. Balard, the Discoverer of Bromine.

M. le Comte Ludovico de Courten has sent me the end of his interesting communication upon the reproduction of engravings by means of photography, and I think that the readers of the Photographic News will not be uninterested in it, as they have already been informed of the first part of our friend's work. When the image has been intensified by the aid of bichloride of mercury, so that all its details are well seen, it is fixed with hyposulphite of soda. M. de Courten then recommends that it be washed with care, and submitted to treatment which has the effect of giving the image an opaque, brownish tint, almost impermeable to light. To do this there is poured upon the plate a solution composed of—

Water	... 100 cub. cents.
Hyposulphite of soda ...	3 grammes
Concentrated ammonia ...	6 drops

This mixture is applied to the plate, and the film is seen to change immediately from a white silver tint to that of a dark bistre. As soon as this change has had time to operate equally all over the surface, the intensifying action is arrested; for if permitted to continue, the film becomes thinner rather than thicker. The operation is terminated with a thorough washing in plenty of water. The composition of the intensifying bath which we have just given is novel, as our readers will see. It has been suggested by our esteemed correspondent by the results he obtained by means of hydrosulphate of ammonia. The bath, in fact, resembles this salt a good deal, as the sulphur element is joined to the action of ammonia, which, on combining with the mercury, gives a black and opaque precipitate. The principal advantage of this process is to avoid the disagreeable exhalations of hydrosulphate of ammonia, for during the whole operation there is disengaged but the least quantity of ammonia gas. Into a pouring glass is put 100 cub. cents. of water, to which is added 5 cub. cents. of hydrosulphate of ammonia; the negative is treated with this liquid, which should possess a slight lemon-colour tint. As a matter of course the operation must be conducted in a uniform manner. You wash with plenty of water, and then you cover the plate with a thin film of gum before varnishing it.

A third process, which gives excellent results, consists in treating the negative with an iodized solution made up in the manner following:—

Water	100 cub. cents.
Iodide of potassium ...	3 grammes

The action of this intensifier should be prolonged until the exposed film appears of a dull greenish colour regarded by reflection on the face or back; while it is of a velvet-black looked at by transmitted light. Iodide of cadmium is more expensive than the iodide of potassium, but it gives better results. But whatever the iodized solution chosen, the film should be washed thoroughly after it has been applied. The employment of iodide to complete the intensification commenced with bichloride of mercury has this advantage over all other methods which have been indicated, that it frees all the clear parts of the image, and prevents any tendency to fogging. At the same time there is in this mode of treatment one inconvenience, and that is, that after a time the intensity obtained becomes weaker, and the general appearance of the negative changes to a yellow, even by transparence, and grows lighter and lighter. It is, therefore, only in case of negatives being required for a limited period that M. de Courten recommends the last method of intensifying, whose results are certainly the finest.

Our honoured correspondent makes one more observation in reference to the reproduction of engravings which is of importance. It sometimes happens that blocks of large extent appear fogged in the negative. This is due to the nature of the engraving itself. Certain engraved plates are treated so as to give a softer black in one portion of a picture than in another, and photography of course reproduces these effects in perfect proportion. It is necessary, therefore, before beginning to operate, to examine the picture carefully, so that one may not be led afterwards to reject as defective a negative which, after all, has been successfully produced.

M. de Courten resumes his research in repeating that, in the reproduction of engravings, the developing action must not be pushed too far, and that complete success is only possible by having recourse to intensifying after fixing. Moreover, he adds that as these different operations to which the film is subjected have a tendency to weaken it, it is necessary, in order that the collodion should have the requisite solidity, to cover the plate, in the first instance, with a preliminary coating of albumen—one of three per cent. strength.

M. Jules Girard, who has published several valuable works upon the application of photography to the microscope, has just communicated to the Academy of Sciences the results of his interesting researches upon the transformation of collodion in photographic operations. A microscopic examination of collodion permits one to discover the texture of the film, and to follow the reactions which take place in the production of the luminous impression. When of good quality the collodion plate is translucid and colourless in the event of the collodion being perfectly dissolved, but its composition, age, and the actions which constitute sensitizing, change its texture. The photo-micrographs which M. Girard presented to the Academy, representing enlargements to fifty diameters, demonstrate several phenomena. Old collodion, which gives very fine images, but the rapidity of which leaves much to be desired, is shown to contain liquid bubbles holding unchanged ether. If the collodion contains much alcohol, it has the appearance of a cellular tissue, and if there is much water in the collodion the fibres of cotton become apparent in the form of flocculent matter. Collodion which is too thick gives intensity, but is not rapid; it has the appearance of an undulated cellulo-vascular tissue. The irregularity of the film militates against the clearness of the image. Two indications or proofs are at hand of the time during which the action of sensitizing in the nitrate of silver bath is still incomplete, and of the moment when the operation has terminated. In the first case, the greasy marks, which are an indication of the sensitizing being still incomplete, are full of streaks and groups of crystals, some in the form of needles and some amorphous. It seems as if the crystals of iodide of silver, which were in course of formation, have been arrested in the midst of their development.

In the second case, when the operation of sensitizing is complete, the texture of the film is homogeneous and compact. It is covered with a uniform network, rendered the more evident by those portions which are free from crystals. The greater part of the photographic actions necessary to obtain an image are due to the successive transformation of the crystallographic system, the reaction of the iodide of silver being the most perceptible of all. The result is, that an examination of the plate at different stages of the operation under a microscope of moderate power permits the operator to judge of the success or otherwise of the process he is employing.

Science in general, and photography in particular, has just suffered a considerable loss in the death of M. Balard, who died this week in his 74th year. The illustrious chemist, to whom we owe the discovery of bromine, succeeded Baron Thénard to the professorial chair in the *Faculte des Sciences*, in 1844, and to Darcep as member of the Academy. He replaced Pélouze in the *College de France*, in 1851. M. Balard was President of the French Photographic Society, where his zeal for the new art, his great attainments, and his charming urbanity, won for him the respect and affection of all. Ernest Lacan.

PERMANENCE OF SILVER PRINTS.

BY W. M. AYRES.

May I be permitted to contribute, to the present important discussion on silver prints and their permanence, a few facts gathered during an experience of many years in the production of such prints? I observe that Mr. Mayland, in the last Year-Book, refers to the superior quality of the albumen of commerce a few years ago, as compared with more recent samples, and thus accounts for the prevailing opinion that prints are less permanent now than they used to be. Mr. Robinson, also, in his letter of last week, lays (and I think justly) the chief blame of instability on the albumenized paper, although I cannot follow him in his remark that foreign paper is necessarily a greater delinquent than our own. In my opinion, floating paper on stale albumen, and incipient decomposition of the hypo bath, are the chief causes of instability in silver prints. Both evils are, I believe, preventible, and with proper attention, as I hope to show, there is no reason why silver prints should not be as permanent as any other; and no one will dispute that they are more beautiful.

My own experience, then, confirms my belief that paper originally floated on fresh albumen will keep many days after being sensitized on the silver bath; but, if the same sample of albumen be kept for a fortnight, paper then floated on it will have a richer gloss, certainly, but will turn brown one day after it is sensitized. I am persuaded that fresh albumen has a great deal to do with permanent silver printing. Foreign paper has nothing to do with it, merely because it is foreign. But any paper, if floated on stale albumen, will produce unstable prints.

Again, the permanence of silver prints depends no less intimately on the proper management of the hypo bath. Now, what is the usual mode of fixing in hypo? Why, this: the printer starts with two pounds of hypo, diluted in the proportion of four ounces of the salt to a pint of water, and from time to time either adds a handful of crystals, by rule of thumb, or he keeps by him a saturated solution of hypo, out of which he adds to his fixing bath diluted hypo in the original proportion mentioned above. Now, here, I am persuaded, is the chief cause of prints ultimately turning yellow. After a certain number of sheets have been fixed in a bath managed in this way a decomposition of the hypo is set up. No addition of fresh hypo to the first solution will ever get rid of the products of this decomposition. The prints never acquire the juiciness one likes to see; they always retain a yellow look after fixing in a bath in which this decomposition has begun. Here, also, I can perceive the truth of the remark often made by printers, to the effect that the prints first immersed in a fresh hypo bath looked and kept well, but not so those of a later lot. Of course not, as I can well understand. By the time the later lot reached the hypo bath, the hypo had begun to decompose; and from that moment, unaffected by any addition of fresh crystals, imperfection and instability awaited the later prints. There is no way of avoiding this, but one, and that is by throwing away the hypo solution at a certain stage, as I shall presently show. I may mention, in passing, another objection to the hap-hazard method of re-inforcing the hypo bath by adding handfuls of crystals to it. Strong hypo solution is injurious to the shadows of prints, quite as much as strong cyanide does injury to the high lights of a negative.

The following method of managing the hypo fixing bath I have found to be very superior to that commonly adopted, and to obviate all danger of the decomposition referred to. Every sample of hypo I procure, I first of all test, for perfect neutrality. To prepare a fixing bath for prints, I dissolve five ounces in two and a-half pints of warm water. If it is not perfectly neutral, I add, from a pipette, five drops of a saturated solution of common washing soda. Prints to the amount of five sheets, and no more, are kept fifteen minutes in the bath, and frequently turned over; they are then placed in a bath of tepid water. As soon as five sheets have been fixed, the hypo bath must be thrown into the waste barrel, and another made up of the same strength. For this purpose, I keep hypo crystals in paper packets, of five ounces each, previously weighed. When all the prints have been fixed and washed in tepid water, they are transferred to the rotatory washing-bath, in which they circulate the whole of the following night.

As regards the gold toning bath, I may add, for the sake of giving a complete account of my methods, that I prepare my own gold, using two ounces of pure gold at a time, which come out, after dissolution, four ounces of ter-chloride gold, and are then three times crystallized. I never neutralise the gold stock with an alkali, and I keep the four ounces of ter-chloride gold in permanent solution in one and a-half gallons of common water, in two bottles of six pints each. To prepare a toning-bath, I add ten grains of ter-chloride gold, in solution, to three pints of tepid water, and neutralise it with a little lime water, in the proportion of three parts to one of acid gold. The bath at first is turbid, but the addition of one grain of ter-chloride gold for every sheet to be printed will partially remove the turbidity. If the bath is sluggish at starting, I have in readiness a sixty-grain solution of chloride of calcium, originally prepared in boiling water. Of this, I add to the bath from half-an-ounce to an ounce, which sets the toning going. The first ten grains of ter-chloride gold will tone five sheets; after that, one grain per sheet is my calculation. Liberal use of gold much improves the prints, by shortening their stay in the toning bath. The bath is never used twice. At the end of the day's work it is thrown down for future reduction; and next day I begin another. The prints should be passed, before toning, through three baths of tepid water. Both toning and fixing baths are tepid; and so is the water for first washing the prints after fixing. The tepidity of all the baths is maintained in summer and winter alike.

Such is an outline of my methods of producing silver prints. The cardinal points to attend to, for stability of prints, are the neutrality of gold and of hypo baths, and the rejection of the fixing bath after every five sheets have passed through it. If these rules are carefully followed, I am persuaded there will be no disappointment caused by fading prints. Scrupulous adherence to the formulas approved by experience, regardless of a little trouble at the outset, will in the end repay the operator. And when he once establishes a regular routine, he will find the system I recommend quite as easy to follow as any other; and I think I can guarantee him, ever after, against the reproach of a faded print, provided he secures paper floated on fresh albumen.

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ON THE FAULTS OF THE SILVER BATH.*

It seems that faults in photographic manipulation, although they may be easily discovered, still occasion experienced photographers much trouble to remove, unless it happens that they possess some little knowledge of chemistry. Very few photographers are chemists, however, for the time is passed when photographers were recruited from pharmaceutical and other chemists; and we have often observed that artists who understand nothing of chemistry, do much better in photography than the pure chemists, for if photography is, so to speak, a techno-chemical art, the result is nevertheless a picture which is judged according to artistic laws; and he who does not understand these will hardly succeed as a photographer.

To judge of a process, however, some chemical knowledge is requisite, and the possession of this has saved many men their time and money. In a studio, I know, the prints therein produced some time ago proved grey, mealy, and flat, and the cause of this was at once set down to the employment of a weak silver bath. But the argentometer that was used showed that there was ten per cent. of silver in the sensitizing bath. Now it is well known that argentometers always give false readings in the case of old silver baths, for they invariably put the silver contents too high. It is only Dr. Vogel's silver test that gives trustworthy results. Accordingly my friend proceeded to sensitize his paper in the ten per cent. bath, the pictures getting from bad to worse, until, at last, he considered it advisable to throw the solution into the residue tub, and begin with another bath. This gave good results at once, but the photographer never could make out why the old bath had failed him.

In this way most photographers act who do not know how to investigate a defective bath properly, and who do not mind spending a few florins to know where the hitch is in order to help oneself in future. If pictures are grey and flat, it does not follow as a matter of course that there is too little silver in the dipping bath, for the result may be due to other causes.

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* *Photographische Notizen.*

1. Acid in the bath. This happens more frequently now-a-days than previously from the circumstance that albumenized paper manufacturers add citric acid to their paper. When this accumulates in the silver bath it soon gives rise to defects, and the pictures grow grey. It would be far better if producers of albumenized paper would add a citrate salt to their material instead of free citric acid. The best way to prevent a bath from becoming acid is to add to it a little carbonate of silver. A few pinches of the compound are put into the stock bath and allowed to remain there. According to Vogel's manual, it is a better plan still to add to the bath a ten per cent. solution of carbonate of soda, and then filter. Any precipitate is allowed to remain in the stock bottle.

2. Moisture in the paper. It happens in winter, very frequently, that after sensitizing, the paper is allowed to dry in a cool room. It then retains a good deal of moisture, and will print flat. Albumenized paper, after being sensitized, should always be put into a warm room to dry; the quicker it is in drying the better will be the pictures, and when quite dry, it is allowed to lie in a cool place, so that it may not cockle up in the frames.

3. A too thin albumenized coating. In summer, when the negatives by reason of the brilliant illuminations are very vigorous, it is often desirous to have a thinly albumenized paper, as this yields harmonious prints with such clichés. In winter, however, the negatives are usually matt and under-exposed, and if anything like a picture is required from them a double albumenized, or so-called brilliant, paper has to be employed. The circumstance that the latter costs more does not not enter into one's consideration, and really makes no perceptible difference in a dozen or so of cartes-de-visite. To think of printing flat negatives with thinly albumenized paper, in winter time, is nonsense. Even in summer the negatives are so flat as to require brilliant paper to print them with.

4. A too weak silver bath. Ten years ago it was the custom to make up one's silver bath in the proportion of one part silver to three parts water, and the paper was permitted to float thereon for three minutes. This was quite necessary, too, for at that day the albumenized paper was more strongly salted than at the present day, and the negatives had to be intensified to a greater degree. By degrees, however, the manufacturers of albumenized paper lowered the proportion of salts added to the material, and photographers found that the less salted papers could be sensitized very well upon weaker baths. So in time we came to use baths made up in the proportions of one to eight and one to ten, and the floating operation did not last longer than one minute, or, perhaps, a minute and a-quarter in winter. If such a bath was used to the last drop, it was found that the last pictures sensitized were considerably weaker than those first produced. The argentometer, from first to last, would have demonstrated the existence of ten per cent of silver, but with Dr. Vogel's silver test we would have found but from two to two and a-half per cent. The result is, of course, that flat mealy prints are produced. Such failures as these are best avoided by writing down every day the quantity of sheets sensitized, and then adding to the bath, for every sheet of albumenized paper treated, five cubic centimetres of a solution made up by dissolving ten grammes of nitrate of silver in fifty grammes of water.

5. Organic substances in the silver bath. There are some albumenized papers which gradually tint the dark brown, dilute silver baths being acted upon more rapidly than stronger ones. Usually such baths contain the decomposition products of albumen, and before the solutions begin to turn brown, the proofs betray signs of flatness. To get rid of these evils, either "sunning" or boiling is had recourse to. The first is a tedious operation, and can only be undertaken when the sun shines, and therefore is not practicable generally in winter time. The boiling method does not always fulfil the object in view, for there are substances which are stubborn enough to resist such treatment. The only trustworthy means of decomposing the organic substances in a bath, namely by the use of permanganate of potash, is not yet sufficiently valued by photographers. And the reason for this is to be found in the circumstance, that few operators understand how to employ the same properly. It requires to be dealt with exactly like cyanide of potassium. Too much is injurious. Generally speaking it is employed under the idea that much helps much, and consequently a good round dose is often poured into the bath to be doctored. If the bath was of a light brown to begin with, it at once assumes a dark brown colour, much to the astonishment of the simple-minded operator. The solution is thereupon at once emptied into the residue-tub, while the permanganate comes in for a few unparliamentary epithets, together with the manual or handbook which recommended its use. Nobody dreams of taking the fault to oneself, and yet it is the photographer alone who is to blame. If the permanganate solution is added drop by drop, and the liquid shaken well between each addition, until the reddish tinge imparted disappears, then the treatment answers well. If the rosy tint remains permanent after a lapse of three minutes, then it is a proof that enough permanganate has been added. Very often three or four drops of permanganate of potash solution will suffice to cure a defective bath.

I may add that I have in my time met photographers who imagined that permanganate of potash is a universal remedy for all kinds of evils in a silver bath; it need hardly be said that it is only when the defect in the silver bath is due to the presence of organic substances that the addition of permangate will put matters straight.

Correspondence.

FADING OF SILVER PRINTS.

Sir,—For some time past I have followed with interest the discussion which has been going on in the News on the above subject, more especially the correspondence by Messrs. Bovey, Russell Sedgfield, and Robinson, and the various editorial articles. It seems to be universally admitted that fading has been on the increase in later years, and that prints of very old standing are yet as good as when they were produced, though no extra care has been taken for their preservation. Why is this? That Mr. Sedgfield's ideas in this respect are to a certain extent correct is quite probable, and Mr. Bovey's remarks seem to corroborate this; and the case put by Mr. Robinson of the foreign paper is also, *pro tanto*, one of the sources of failure; but surely there must be some other causes at work. It appears to me that a great deal of this outcry has arisen since the time when so-called economy introduced weak sensitizing baths with nitrate of soda and other trash to take the place of silver to keep the albumen on the paper, together with the American notion of fuming to make up for deficiencies, and I firmly believe here rests the great cause of the evil. I am only an amateur, though now of some twenty years' experience, producing from 2,500 to 3,000 prints (cartes and cabinets) a year; of these I retain one copy from each negative, posted in a guard book for reference, the rest being given away; but I am not aware of any large amount of fading in my work, and I think I should hear of it if it occurred, as most of my prints go into the hands of friends and those I am constantly meeting. It has always been my practice to use so extravagant a bath as one of 100 grains to the ounce, floating from one to two minutes according to the temperature, and I have adhered to it because I find the proportion of silver and water absorbed is so nearly equal, that, after having had the solution in use for about ten years, replenishing, of course, from time to time at the same strength, I find it still retains its standard of 100 grains. For paper I have used ———'s for many years, and though it is now reduced in price to be one of the cheapest in the market, it has not deteriorated in quality; but I have at times, from my stock running out, used that of many other makers procured from local dealers, but have not noticed any defect in durability to arise from doing so.

I feel that I ought to apologise for this long letter, but I plead guilty to a great love for silver printing, and should therefore be glad to add my mite of help to sustain an old favourite; and I should also like to hear through your pages the experiences of other strong bath printers, the more especially as I must say my small experience of carbon printing did not satisfy me as to results, and left on my mind the impression that it was both a troublesome and dirty process.—Yours truly, F. Lane.

Sir,—Will you kindly allow me to say a word in reply to Mr. Sedgfield's letter in the News of the 17th instant, on the fading of silver prints?

Mr. Sedgfield attributes this defect to carelessness, economy, or the fact of their being produced in a country studio; and, as I have been troubled very much lately with the defect in question, I am anxious to get at the bottom of it.

Now, I commenced to take photographs about twelve years ago, with as cheap a kit and under as many difficulties as most people, and my first productions were made in a barrack-room, and the prints were finished in a basin-plate and a pie-dish; yet these prints can put to the blush, for keeping quality, the pictures I produce now, after twelve years' study and practice, with a kit and appliances second to none.

I enclose you prints produced twelve years ago in the above manner; also prints produced three, six, nine, and twelve months ago; also fresh prints from the same negatives.

I think you will agree with me that the fresh prints look innocent enough; but that they are consumptive the ones of a few months old will show; and, what is worse, they are not only consumptive, but they grow hard, lose their tone, and get the small-pox in a most unaccountable manner. They appear to have a trace of nitric acid in their composition, but how did it get there? If the paper is defective, it certainly should not be. I pay a good price for everything. I deal with a respectable house, who advertise their chemicals as the "purest in the world," and for years I have paid £10 a ream for the paper they are produced on, and I do not think that can be called economy.

The paper is floated on a neutral bath, composed of silver and nitrate of soda, as recommended, I believe, by Mr. Bovey (a gentleman of no small experience in the production of silver prints); they are toned in an acetate of soda bath, and fixed in the usual way, and afterwards washed in a running stream, with the water drawn from the bottom, from three p.m. to nine a.m. the following morning, and if they are not washed then they never would be.

With regard to carelessness, I am too fond of the art to admit of anything careless connected with it, and although I do not print myself, I am quite confident there is nothing carelessly done in my place, so that being the case, unless this expensive paper is at fault, why do they fade?

It would be nonsense to try and persuade me that, after giving my mind thoroughly to photography for twelve years, and producing negatives and prints nearly every day of my life since in quantity and in all sizes, from C.D.V. to 18 by 16 inches, I know less about it than I did at first, or that a pie dish is the proper thing to wash a print in.

Now, unless there is something in what Mr. Sedgfield says about their being produced in an unsuitable climate, or the paper at fault, the whole thing is a mystery, as far as I know; but I belonged to a cavalry regiment for sixteen years, and during that time was stationed in most of the large towns in the three kingdoms, and consequently have had a chance of seeing country as well as town work, and I am quite confident that the worst work I ever saw emanates from the lower class of London photographers, and if that work is permanent, all I know is that it is a very great pity.—Yours truly,

W. Penny, Staff Sergeant,
Photographer to the School of Musketry.
School of Musketry, Hythe, March 29, 1876.

[Our correspondent encloses some admirable card portraits, those just produced with a rich tone and fine bloom, similar prints a few months old, with the charm gone although not absolutely all faded; whilst some of twelve years old are in a much better condition.—Ed.]

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Proceedings of Societies.

Photographic Society of Great Britain.

The usual monthly meeting of this Society was held in the Water-Colour Gallery, Pall Mall, on the evening of Tuesday, the 4th inst., Mr. Glaisher, F.R.S., in the chair.

The minutes of a previous meeting having been read and confirmed, the following gentleman were elected members of the Society:—Messrs. W. F. Henry, Ernest Soutter, and C. A. Woolnough.

Mr. John Spiller, F.C.S., then read a paper entitled "A New Method of Photography." He premised his paper by saying that from the very full attendance of members, he feared that possibly some of them might have formed too high expectations in regard to the paper he was about to read, which was rather descriptive of an interesting scientific fact than of a process which, at present, possessed much practical utility. The discovery upon which it was based was made by Mr. Francis Jones, of Manchester, who had discovered that when sulphur was brought into contact with antimonietted hydrogen, in the presence of sunlight, a decomposition ensued which produced orange sulphide of antimony. He exhibited some prints of fern leaves printed by an application of this fact, and some others of darker colours, which he had attempted to tone by salts of silver and of copper. He believed that this was the first case in which a gas had been used as a sensitizing agent.

After some remarks on the scientific interest by the Chairman, a brief conversation ensued as to whether the gas were not more truly a developing agent, which Mr. Spiller explained it was not, and Mr. Friswell, the Honorary Secretary, pointed out that the case was analogous to many in chemistry. Chlorine and hydrogen might, for instance, be enclosed in a tube, and remain without action upon each other until they were exposed to the light, when an explosion resulted.

In answer to a question, Mr. Spiller stated that the exposure to produce fern leaves was twenty minutes. After some conversational discussion as to the diffusion of the gas through the felt of the printing-frame and the paper, and on other points, in which Messrs. Sawyer, Whitfield, Spencer, and several other members took part, Mr. Bedford expressed a conviction that the process was very interesting as illustrating a scientific fact, but, at present, there seemed to be an absence of half tone and all qualities which would give it practical value.

Mr. Friswell pointed out the necessity of care in experimenting, on account of the extremely poisonous character of the gas.

Mr. Hooper said the full meeting showed the keen interest of members in anything promising novelty in their art, and promised at an early meeting—probably by June—to show results of a printing process, without the vulgar gloss of albumen, better than carbon, and, at least, as permanent (laughter). Mr. Hooper was proceeding on general topics when the Chairman reminded him that he was ranging out of the subject. He hoped he would bring the specimens he had promised to the June meeting, adding that otherwise the subject might be forgotten!

The Chairman called attention to some charming examples of floral groups photographed and coloured by Mrs. Payne, of Aylesbury, their newly elected member last month. He also called attention to some numbers of "Men of Mark," photographic portraits by Mr. Whitfield, printed by the Woodbury process.

The proceedings then terminated.

Talk in the Studio.

South London Photographic Society.—At the next meeting of this Society, to be held in the Rooms of the Society of Arts, on Thursday, April 13th, Mr. W. Brooks will read a paper "On a New Collo-developer."

Kennett's Pellicle.—We understand that a rumour has, by some strange chance or malign intention, acquired circulation to the effect that the preparation of Mr. Kennett's pellicle had been given up as a failure. It is, on the contrary, as we are assured, daily progressing in use, the demand steadily and rapidly increasing, as well as the assurances of the satisfaction it has given.

Bromide of Potassium in Albumenized Paper.—The Editor of *Anthony's Bulletin* says:—"The addition of a small proportion of a soluble bromide to the ordinary salting of albumenized paper, which is exciting considerable attention among translantic circles, is not new on this side of the ocean. Many years ago it was suggested to the writer by Mr. H. J. Newton, of New York, and the idea was acted upon by him. Having made some dry plate negatives which were rather hard on printing, he had some paper manufactured especially for him, and, according to his instructions, containing bromide of potassium. He found that with this paper he could obtain harmonious prints from his hard negatives. We think that his experience in this respect is valuable, and might beneficially be acted upon by persons similarly situated."

To Correspondents.

⁂ To Agents and Advertisers.—Next Friday being Good Friday, the Photographic News will be published on Thursday, April 13th. Advertisers should send in their Announcements not later than Wednesday, April 12th.

F. R. B.—Your questions on enlarging are singularly vague and indefinite, and give us scarcely any idea of what information you require. You ask first, "Must the lens be covered or not?" For whatever purpose you use it the lens must be uncovered, or how can you use it? Does your question refer to the brass-work of the lens? It is sometimes necessary to cover the brass-work if you are copying anything with a reflecting surface. Or do you mean, in enlarging from a transparency, the space between the lens and the transparency? In your second question you say, "What developing solution?" For what? What is it you wish to develop? Paper or collodion? Your third question is more definite, but not sufficiently so. You say, "How do you find the focus of a lens?" But you do not say whether you mean a single lens or portrait lens. The focus of a single lens is the distance between the lens and ground glass, when a distant object, like the sun or moon, is in focus. If—as is most probable—you wish to ascertain the equivalent focus of a compound lens, take any object (say a cabinet portrait) to produce an image of it on the ground glass the precise size of the original, then unscrew your lens from the camera, and measure the distance between the cabinet and the ground glass. One-fourth of that distance will be the focus of your lens.

G. E.—There are various modes of using the magic lantern for enlarging; but we do not think you will find a duplex burner give you nearly sufficient light for enlarging direct on paper. To produce a direct image on sensitive paper it requires about an hour's exposure to sunlight with a solar camera. Obtain at Mr. Solomon's the little pamphlet he issues, entitled "Photography in Four Lessons"; you will there ascertain what can be done in enlarging by means of a magic lantern.

G. E.—First try the collodion with a full exposure and strong developer—say 30-grains of the iron salt to an ounce of water. If the result is not soft enough, add from half a grain to a grain per ounce of bromide of cadmium; but it is probable that you will obtain the desired result without.

Veritas.—As a rule, the best mode of managing the light in any special studio is much better ascertained by a few experiments than it can be stated on theoretical ground. Theoretically, we should seriously condemn the construction of your studio; yet it is possible that by a little contrivance and arrangement, determined on the spot, good results may be obtained. The place occupied by your dark room should have been glass to give you a good North side light. There should not be any window in the end of the room opposite to the sitter at all. The board you describe in the ridge was not, we imagine, intended to reflect light, but to shade the house from the nearly vertical rays of a summer sun at midday, which would often pass through the North skylight into the house. We should think the board in question unnecessarily high, and should be disposed to remove it altogether, using blinds, when necessary, inside, rather than have a permanent screen cutting off light outside.

F. B. R.—Either a portrait lens or a triplet may be used with an enlarging camera. Use that the focus of which is most suitable for your purpose.

E. T. Smith.—The choice between wet and dry plates depends on many considerations. Each system has its advantages. Dry plates are much more easily carried, and involve taking into the field much more limited impedimenta. Wet plates involve the use of a dark tent or box; but they possess the advantage of being more easily worked, and of permitting the photographer, by developing on the spot, to see at once what he has obtained, and whether it is rightly exposed or not. 2. We should say the coffee process, or Captain Abney's albumen process, would suit an amateur well. 3. There is not much difficulty in learning any of the dry processes. It is chiefly a matter of care and precision in following instructions. Regarding the graphogenic apparatus, there is no especial difficulty in working it, but it requires considerable neatness and care. We have never worked one in our own operations, but have seen it skilfully worked by the inventor. The fact, however, that it has passed considerably out of use suggests absence of success in many hands.

R. P.—The letters C. P., applied to nitric acid, refer to the standard strength as set down in the American Pharmacopæa. The formula, 40°, means forty degrees, and applied to alcohol has reference to the recognized standard of Beaume's hydrometer. It indicates a sp. gr. of ·817. There is no process recognized as the "lighting process." If you had made an exact reference to the page where the term was used, we could have told you, probably, the sense it was intended to convey Schlippes' salt is sulphantimoniate of soda. You will find details in our volume for 1865, or the Year-Book for 1866.

R. M. (Weston Subedge).—We do not recommend the use of carbonate of soda in toning baths, because if used too soon after mixing the bath bleaches, and if delayed too long it becomes inactive, and altogether it is a dangerous bath except in experienced hands. The acetate bath is as good as any for a keeping bath; and for one required to be mixed and used at once, there is nothing better than carbonate of lime (common chalk) added to the stock solution of gold, sufficient to make it into a thin paste, then pour hot water to make up the quantity (say, six or eight ounces to a grain), and use when cool. We do not recommend kaolin for clearing a printing bath. Add a little hydrochloric acid, and shake up. The precipitate formed will take down the colour. We regret that our arrangements do not permit us to write private letters in answer to photographic questions.

N. F. Y.—There are various formulæ for intensifying with gold which we have given in our Year-Books from time to time. An old gold toning bath will answer; but it is slow. A simple solution of chloride of gold one grain to an ounce of water neutralized by chalk will answer.

J. H. W.—Your photograph of oxen produced on a coffee dry plate is very good. The foliage in the background would have been better for a little more detail. But that is chiefly due to the light.

A Learner.—A magic lantern with lime light may be used for producing an enlarged developed print on paper. The sensitive paper will take the place of the screen. Mr. Solomon publishes a little work which gives full details for working in this way with magnesium light. All the formulæ and instructions will be equally suitable for use with the lime light; but the exposure will be a little longer.

Syphons.—Sir Thomas Parkyns writes strongly deprecating the method described by "Gustavo," in which the dangerous and often uncleanly plan of creating a vacuum in the syphon by using the mouth is involved, and offers, if "E. L." and "Gustavo" will communicate with him, to send them each of his little syphons as a present, satisfied they will use no other, unless they can improve upon the form, in which case he will be glad to hear of it. The address is, Sir Thomas Parkyns, Harnham Cliff, Salisbury.

Received.—"Every Man His Own Photographer."

Several Correspondents in our next.

The Photographic News, April 13, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography and Illustrated Journalism—New Publications—An Old Photograph.

Photography and Illustrated Journalism.—There is a possibility of a London daily illustrated newspaper being published, something after the style, we suppose, of the *New York Daily Graphic.* This newspaper, although hardly to be compared with our London illustrated papers, which are published weekly, has a knack of producing sketches and cuts with singular rapidity, and the interest felt in the matter makes up in some degree for the roughness of execution. It is next to impossible, as our readers may know, to produce large sketches upon wood, and get them cut within four-and-twenty hours, and therefore, if pictures are produced in this way, one can hardly expect that matters which occur one day can be pictorially reported the next. That the New York paper is very rapid in its work is well known, and it is in the main due to photography that the pictures are so quickly done. Some time ago, at the time of the Beecher-Tilton case, a most extraordinary feat in publication was performed in this paper by the aid of the camera; our American contemporary producing upon half-a-dozen broadsheets a *fac-simile* of the letters and correspondence connected with the lawsuit. To those who felt an interest in the matter such a thing was peculiarly attractive; for in letter-writing, as we know very well, as much depends almost upon the character and style of the writing as upon the words themselves, and not unfrequently a very good idea may be formed of a man or woman by a study of his or her letters. The *New York Daily Graphic*, then, working as much with the aid of the camera as that of the artist, is enabled to put before its readers, in a very short time, pictures or reproductions which otherwise would require days at least to execute, and any similar journal published in London must, of necessity, invoke the aid of photography in producing much of its matter. As yet we have scarcely arrived at such a point of perfection in photo-mechanical printing as would warrant anyone in starting a daily illustrated paper to contain pure photographs only; for although many photo-engraving processes of considerable value are known, there are none that could furnish thousands of copies, from any description of negative, in a dozen hours or so. What is wanted, and what we shall have, no doubt, before many years have passed away, is a method by means of which we can produce prints equal to carbon or photo-relief pictures in ordinary printers' ink, in the same way precisely as the metal clichés or wood-blocks are printed. If a house fell down in the Strand, or a railway collision took place on one of our lines, or a new statue were unveiled, we should hope to see a photograph taken on the spot the next morning at breakfast; and in producing such photographic illustrations we should not in any way be intruding on the domain of artists and wood-engravers. There would be quite as much work for these to do as heretofore, for the photographer's labours would be directed towards an entirely new class of work. It would be, as a rule, only in matters of still life that the photographer could produce satisfactory pictures, as it could not be often that circumstances would permit of a good instantaneous view being secured. Where public gatherings, busy scenes, banquets, and the like are to be reproduced, the artist would be as much in requisition as at the present day; but where absolute truth in the reproduction is desired, there the camera would be invaluable. The *photogravure* process—which is a photo-relief process with a grain, and therefore capable of employment with greasy ink—is one of the most promising methods we have seen, although we do not despair of something good being done one of these days by the so-called photo-electric method, which has given results in its time of very fair quality.

New Publications.—Whilst on the subject of photographic publications, a word may be said on behalf of "Men of Mark," a work published by Sampson Low, Son, and Marston. Each part contains three cabinet portraits by the Woodbury photo-relief process, and these are, so far as we have seen, very well executed. The fact that the portraits are permanent must be a great consideration with purchasers, for otherwise it would scarcely be worth one's while to take in such a publication regularly. It will be a long time indeed, we cannot help thinking, before the public will gain confidence in the durability of photographic prints, for the term photographic has come to be looked upon of late as tantamount to the word fleeting. It is strange to think that some of the earliest photographs executed are still in existence, while those recently prepared are many of them faded away.

An Old Photograph.—Of photographs now in existence, one of the oldest is a picture of Kew Church executed by Nicéphore Niepce in 1824, during his sojourn near Kew Bridge about that time, and which is, or was until lately, to be seen in the British Museum, having been produced by the bitumen-of-Judea method. It was this identical picture which to a great extent saved Niepce's reputation as the first practical photographer, and it may therefore be considered in this sense as quite an historical production. Nicéphore Niepce, it may be remembered, communicated to Daguerre the whole of his experiences at the time they formed their partnership, but nothing was made known to the world of their photographic knowledge till Daguerre published the Daguerreotype process in 1839, some years after Niepce's death. Niepce came to London about 1824, not so much to sell his invention of photography, which he hardly considered sufficiently matured, but rather to tend his brother, who had fallen sick, and aid him in the sale of a kind of velocipede, which they had jointly invented. It was then that he produced some images in this country by the aid of light, and these were subsequently shown to the scientific men of the day. When some years afterwards the news of Daguerre's great discovery came to this country, the matter, as might have been expected, was freely discussed at the Royal Institution, and one of the Daguerreotypes was placed in Faraday's hands, with the words, "You have never seen anything like that before." Faraday looked at the picture carefully, and then returned it, saying confidently, "Yes, I have; some years ago a Frenchman put a picture of the kind in my hands, and I remember his quaintly saying that the light had done it; it was a little picture of Kew Church, as I recollect very well." These words of Faraday set many thinking, and Mr. Banner (then secretary of the Royal Society) also called to mind the Niepce pictures, which he remembered had been brought to him to be submitted to the Royal Society. He could not take this step, however, as Nicephore Niépce refused to divulge the manner in which they were produced; and as the Royal Society never entertain secret inventions, the affair fell to the ground at the time. Upon this, the Academy of Sciences in Paris was communicated with by Mr. Bauer, and attention was called to the previous attempts of Nicephore Niépce. Till then nothing had been heard of the early investigator, for although he had been in his lifetime the partner of Daguerre, that gentleman omitted all mention of Niépce's name when he brought forward Daguerreotype. In the end, however, he acknowledged having received information from Niépce, and the son of the latter pressing forward a claim, the French Government awarded him a pension as well as Daguerre. The little bituminous picture of Kew Church, therefore, which Nicephore Niépce had produced in this country, had much to do with vindicating his honour, and also with ensuring competency to his family.

FURTHER NOTES ON THE EFFECTS OF LIGHT ON PIGMENTS.

BY R. H. BOW, C.E., F.R.S.E.*

Two years ago I gave some results of a series of experiments on the effects of sunlight on a variety of pigments. The most notable of these results were the satisfactory permanence of Prussian blue, especially as an oil paint, and the unexpected deficiencies, in this respect, of Vandyke brown and some other colours. I also noted the discovery that a liberal supply of gum-arabic gave greatly increased stability to the splendid scarlet biniodide of mercury.

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* Read before the Edinburgh Photographic Society.

Some months ago a promising young analytic chemist placed in my hands a set of aniline colours prepared by Messrs. Dahl, of Barmen. This prompted me to prosecute further experiments upon the permanence of these colours; and the great variety of their behaviour when mixed with different mediums led me to hope that I might hit upon some substance that would confer upon some of these colours, when used as paints, a satisfactory degree of permanence. It was when thus hopeful of a valuable result that I rather rashly consented to read a paper on the subject. But further experimenting has not led to success, and the deeper I have gone into the matter I have felt more and more convinced that the daily extending use of the aniline colours must be looked upon in some of the directions it is taking as a serious evil. The colours I dealt with were named:—

No. 1. Methyl green.
2. Blue-green (light).
3. Alkali blue.
4. Methyl violet, B.B.
5. Methyl violet, R.
6. Rosaniline hydrochlorate.
7. Cerise.
8. Phenol yellow.

I may remark that the manufacturers of the violets attach letters B or R to the name to indicate the blueness or redness of the hue, sometimes using as many as four letters.

These aniline colours are characterized by a great many interesting chemical and optical properties [some of these were exhibited before the Society.] They are all readily dissolved by alcohol, but all are insoluble in turpentine. No. 1 is very soluble in water, No. 2 not at all so; the others are soluble more or less in water, but not so perfectly as in alcohol.

To arrive at correct ideas regarding the chromatic qualities of a pigment, it is necessary to ascertain which rays of the spectrum it absorbs, and this is very easily done when the colour is presented in the condition of a transparent solution. All we have to do is to place some of the liquid in a cell having sides of plate-glass, and look through this at the spectrum; or, still simpler, a white glass bottle containing some of the solution may be placed just outside the slit of the spectroscope. Tested in this way it will be found that the beautiful colour No. 4 is not truly a violet—as is a deep solution of ammonio-sulphate of copper—but, like most of our richer blues, a *purple;* by this I mean that we have in it an admixture of some of the red of the lower or near end of the spectrum. Indeed when this colour, and also Nos. 1, 5, 6, 7, and 8, are taken of such depths that only a small portion of the light from the sun can pass through them, that residual light is pure red.

An amount of the colour No. 4, which thus cuts off all the spectrum but red, may show the lines A and *a*, and have its centre of illumination midway between these lines. On reducing the depth of colour, the band of red becomes broader and its centre of illumination advanced to (say) a little beyond *a*; and now a violet band of light appears of about the same width as the red one, and having its centre of illumination at a distinct line between G and H, say G 0·56 H, that is to say, 56 hundredths of the distance between G and H in advance of G. (This is a convenient way of noting the position, but is only approximate, as the apparent proportions will vary with different prisms.)

On further reducing or weakening the screen of colour, the blue band increases in width and brightness much more rapidly than the red band; and as the weakening goes on the centres of brightness of the bands approach nearer to the centre or yellow of the spectrum; thus at one stage we have the red so widened out that its centre of brightness is advanced to B, while the band at the blue end is so much widened as to embrace G and H, and has its centre (as judged of by reducing the light) at G 0·43 H. We here have both extremities of the spectrum well seen; and the blocked-out portion becomes narrower and narrower as we reduce the depth of colour of the liquid, until, when greatly attenuated, the only peculiarity strikingly visible in the full sunlight is a narrow dark shading around D.

On adding an acid—say hydrochloric—to Nos. 4, 5, 6, or 7, the solution, after passing through some intermediate colours, is, when sufficient acid has been added, changed to yellow, and on adding water in large quantity to the yellow solution there is a partial revival of the original colour. No. 4 exhibits these curious changes in the most perfect manner, and I beg an exhibition of your patience while I more particularly describe the chromatic changes.

By gradually adding hydrochloric acid to solution of the methyl violet, BB, the liquid assumed in succession a beautiful variety of tints, passing from purple through blue, blue-green, green, yellow-green, and at last reaching yellow. It is interesting at the same time to examine these various colours by the spectroscope. I shall only mention that while we may notice some minor movements of the red band, the more refrangible or advanced one travels gradually backwards, changing in colour from violet to blue, and then green. When the yellow colour has been produced, the spectrum shows that the two bands have coalesced, and from a point near E the forward portion of the spectrum is shut out, while the extreme red is well seen.

On adding water to this yellow mixture, it first becomes (say) a fine green, the spectrum of which shows a red band with its centre between B and C, and a wide green band with its centre below E. Adding more water causes the latter to rise to E, while the red remains at its previous position. Adding still more water causes the blue to open out, so that there is little loss of light, except from a dark shading at about C, 0·4 D, and a general dimness in the spectrum behind a point a little in advance of D.

The effect of light upon the simple aniline colours is soon manifested by the destruction of the beauty of all the samples except No. 8, and a few hours' exposure materially injures the fine purple violet, No. 4, by reduction of its blueness, and, after a few days' exposure, the four colours, 4, 5, 6, and 7, are all turned to nearly the same dirty crimson red, 4 and 5 losing blueness, and 6 and 7 becoming darkened. A more lengthened exposure then reduces the depth of colour of each of these, all becoming much lighter, especially No. 4, which is at last almost quite bleached. These successive changes are shown on sheet B. The fine green colour, No. 1, does not show such rapid change at first, but the loss of depth goes on regularly, and on sheet A, where not protected by coloured glass, has become almost white.

The blue, No. 3, soon loses its beauty, but after lengthened exposure still retains a considerable body of colour.

The seven samples first in our list are thus shown to be very unsatisfactory, and No. 8, though much better, is far from permanent, as there is evidently some loss of beauty and depth of colour. The effects upon the aniline colours of the light from different parts of the spectrum should be a subject of considerable interest to photographers. It would be tedious to apply the actual spectrum, even in the most favourable circumstances, and the dark season of the year in which I experimented precluded any attempt at this. But I have exposed some of the colours under stained glasses, and, making allowance for the depth of the tints of the glasses, it appears that the methyl violet, B B, is acted upon with considerable energy under the red, orange, yellow, cobalt blue, and the paler purple, whereas the green glass preserves the blueness of the colour in a very remarkable manner. In order to establish satisfactorily whether the more refrangible end of the spectrum acts with much energy in this colour, it would be necessary to expose it under a cell containing solution of ammonio-sulphate of copper, so that the red and yellow rays might be completely cut off.

The orange-coloured glass, as shown on sheet A, has a well-marked power of preserving the methyl green, No. 1; and under it, although the phenol yellow, No. 8, is somewhat reduced in depth, the colour left is a very pure yellow. I need not speak of the power of the coloured glasses to preserve the dirty red hues to which Nos. 4, 5, 6, and 7, are soon reduced.

The effects produced by mixing the aniline colours with different mediums is so decided and various, that the hope I indulged in that some substance might be found capable of preserving the beauty of the violet, No. 4, was not altogether unreasonable.

The effects of more than twenty substances were tried upon this violet. Several—such as paraffine, wax, sperm, &c.—were quite inert. Those which appreciably increased the permanence were starch, white of egg, and Canada balsam; witht hese the colour was preserved to a considerable extent in body, but turned to a purple much less blue than the original. With shellac varnish, the sunlight destroys the beauty of the colour, but leaves it in some cases fully darker than the original.

But the most remarkable and alarming result is that for the mixtures with drying oil, megilp, or Robertson's medium; the destruction of the colour by the action of the sunlight is greatly hastened, compared with what takes place with the simple colour. Before altogether disappearing, the colour becomes green and yellow.

With mastic varnish, also, the colour goes rapidly.

Examples are placed on the table of printed circulars that have been sun struck, and many such may be seen any day in our streets or shop windows. I just lately observed a poster originally printed in blue ink, which a few days of sunshine had reduced to a base dirty green.

The use of these beautiful colours is becoming every day more extended, and a watchful eye ought to be kept upon their employment for unsuitable purposes.

It was but last summer that in woollen fabrics, many of the grey trouserings had received a dip that greatly improved their colour; but the result was, that after a few weeks' wear, the parts most exposed to the light exhibited a dingy yellow hue, giving a dirtied appearance as contrasted with the more shaded parts. Then as to cotton prints: I am sure you will agree with me in thinking that nothing can look nicer than a well-made, clean cotton print dress, and the great value of these prints was, in older days, that though easily soiled, they were easily washed, and the washing had little impairing effect upon the colours. But I here show you a specimen of cotton print which, after three ordinary washings, became white; and a piece of the cloth was reduced at one operation of a more thorough kind, to the pure white state shown by the piece I lay before you. There is an unfortunate change going on around us in the matter of dress; these cleanly cotton prints are falling into disuse, and in their stead we find nasty finery, woollen and silken fabrics which, in a short time, become offensive with dirt and grease. Now, if the use of these dyes in cotton printing hastens in any degree this most objectionable change in the mode of dressing, it is a point against them of considerable sanitary and æsthetic importance. If the increasing custom of the people to wear unwashable garments is not to be stayed, it is very desirable that some effort should be made to introduce the use of cotton blouses to protect the other fabrics when engaged in occupations that soil the clothes.

Aniline colours are now used for writing ink: their not corroding the steel pens is certainly a great advantage, but writings are frequently much exposed to light, and the faintness to which they would be reduced may be a source of annoyance.

From the injurious effects of drying oils upon some of these colours, their employment for printing inks is much to be condemned—the more so that we have been led to place great confidence in the permanency of printed documents. And this use of aniline colours for printing inks may become a very serious evil should they be used among those employed in producing high class chromo-lithographs—and the temptation to do so is considerable, from the variety and beauty of their tints.

For travelling so much outside of my subject, as I have done, I must beg to be excused on the plea that otherwise my contribution would have been ridiculously short.

NOTE ON THE PRODUCTION OF ANTIMONY PHOTOGRAPHS.

BY JOHN SPILLER, F.C.S.*

The photographs which I have the honour of submitting to the notice of the Society are the work of Mr. Francis Jones, of the Manchester Grammar School, who showed them at a recent meeting of the Chemical Society, as having been produced in the course of some experiments upon the gas known as stibine, or antimonietted hydrogen, SbH_3. The author found that when a current of this gas was passed through glass tubes containing sulphur, and exposed to sunlight, a decomposition was effected, resulting in the formation of the orange sulphide of antimony, the chemical reaction being explained as follows:—

$$2SbH_3 + 6S = Sb_2S_3 + 3H_2S.$$

No action takes place in the dark; so that it was found possible to utilize the reaction as a photographic printing process; and the impressions of ferns now shown were obtained by simply passing a current of antimonietted hydrogen through a kind of printing-frame containing a sheet of paper impregnated with sulphur, upon which the fern was laid, and gently pressed into contact by a glass plate in front.

For the preparation of the sulphur-paper Mr. Francis Jones saturates ordinary writing-paper with a solution of sulphur in carbon disulphide, and allows the solvent to evaporate in the air. By this means minute crystals of sulphur are left deposited in the pores of the paper; and any excess remaining on its surface can be rubbed off with a tuft of cotton wool, so as to ensure uniform impregnation. No fixing process is required; for as soon as the printing has advanced sufficiently far, it is only necessary to stop the evolution of the gas, or disconnect the generator, whereby all further action is prevented, and the image remains as a permanent metallic sulphide imbedded in free sulphur. The tint thus resulting is identical with that of the pigment used in the production of red rubber goods, and is believed to be equally permanent. I find, however, that an after treatment with silver or copper salts in solution transforms the orange sulphide of antimony into the darker coloured sulphides of those metals; so that the process, thus modified, lends itself to the production of photographs of a more agreeable tint.

For the toning of these red antimony photographs I have used a cold solution of ammonio-nitrate of silver, which does not affect the protected (sulphur) portions of the design, but quickly blackens the sulphide of antimony. In the specimen shown, the excess of silver was afterwards removed by washing with dilute ammonia; but I found no difficulty in applying a weak hyposulphite solution for this purpose. It is important, however, to avoid the application of heat whilst toning; for under these circumstances the alkaline silver solution readily acts upon the sulphur, and a general blackening is the result. Mercury salts did not work satisfactorily, and acetate of lead not at all; but an agreeable brown or chocolate tint may be got by toning with ammonio-sulphate of copper. An example is shown in which, judging from the colour of the deposit, we may fairly assume that the design is built up of a double sulphide of copper and antimony.

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* Read before the Photographic Society of Great Britain.

Care must be taken to avoid the inhalation of antimonietted hydrogen, which is a poisonous gas; but inasmuch as the printing operation would ordinarily be conducted in the open air, there is less chance of danger from this cause. The gas itself is evolved by acting with dilute sulphuric acid upon an alloy of zinc and antimony containing five per cent. or less of the last named metal, which can be prepared without difficulty by throwing the required proportion of metallic antimony into the melted zinc, and granulating as usual by pouring the fused metal into cold water.[*] A Woulfe's bottle, with funnel and delivery-tube, forms a convenient apparatus for generating the gas; and if it is led into the felt pad of a printing frame during exposure to sunshine, the gas rapidly diffuses itself and permeates the paper, as in the well-known ammonia-fuming process. There is, indeed, a remarkable analogy between the two processes; for in both cases a gas is made to act as sensitizer, although ammonia, NH_3, only partially fulfils the object here proposed to be effected solely by SbH_3.

The corresponding reaction with arsenietted hydrogen, AsH_3, has been tried, and gives the yellow sulphide of arsenic; but all considerations unite in condemning the prosecution of further experiments in this direction. The gas is extremely poisonous, and the pale yellow colour of the resulting picture renders it of little practical value.

It cannot be said that the antimony process offers at present any substantial advantages; but it is interesting from a scientific point of view, and may yet become available either as a photometric process, as the inventor seems inclined to suggest, or for special purposes where the production of such coloured photographs at a low cost may chance to be a desideratum; at any rate, no apology need be offered for bringing the facts of the case to the notice of photographers through the medium of this Society.

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SUPPLEMENTARY PAPER ON GELATINO-BROMIDE.

BY REV. H. J. PALMER, M.A.[†]

At the close of my paper on the gelatine process, addressed to your last meeting, I stated that the discovery had been made that pellicle dissolved in beer produced even more brilliant negatives than the emulsion prepared with water. At that time I had not had an opportunity of experimentalizing in this direction. Since then, however, I have been able sufficiently to test the value of the proposed change, and I venture to send a few negatives, exemplifying the result. The advantages of beer *versus* water I find to be these:—

1. The emulsion flows readily over even large plates, without necessity for the glass rod.

2. The drying takes place more quickly than with the water.

3. The negatives are more brilliant in the shadows, and lose all tendency to fog.

4. Intensity is obtained to any extent with the alkaline developer.

5. Great latitude of exposure is permissible.

6. A brighter light may be used in the dark room.

The only disadvantages seem to be:—

1st. That the pellicle takes a longer time to dissolve in the beer.

2nd. That the plates are somewhat slower. The accompanying negatives must not be considered as the best specimens of this process. The portraits have all been taken under great difficulties, since I do not possess either glass, room or backgrounds. I think, however, that they sufficiently attest the exceeding value of these dry plates.

They enable the photographer to obtain landscapes quite equal in every respect to the best of those yielded by other dry processes; while at the same time they permit him to work at portraiture, or at interior subjects, with exposures less than those with which wet plates could be employed with success.

The print of a group which I inclose is singular in this respect, that the plate on which I took it was prepared a year before it was exposed on Friday last. The lens used was a Ross' doublet for landscapes of medium angle; the stop was that with the widest aperture; the light was bright,, but without sun; the exposure was fifteen seconds. I have taken the liberty of sending half a dozen of quarter plates that a few of the members of your Society may have an opportunity of testing the process. I have not worked with a portrait lens, and therefore cannot advise as to time of exposure; but I may say this, that with Ross' 5 by 4 doublet, widest aperture, I should for a portrait give thirty seconds in a good light.

◆

ON THE SILVER BATH AND OTHER TOPICS.

BY J. J. V. W.[*]

It has long been a matter of conjecture on my part whether there is such a thing as an over-iodized bath. But in the face of so time-honoured a dogma, and one supported by such eminent authority, I have never felt justified in roundly asserting, even to myself, that the negative bath could not be over-iodized, and that the whole theory was a delusion. Nearly all authors on photography tell us to prepare the bath with a certain quantity of silver dissolved in a certain quantity of water; then to add to about seven-eighths of this solution as much iodide of potassium (or iodide of silver) as it will take up. When the solution is saturated, we are to add the remaining one-eighth. The object of this manœuvre is to prevent the bath being entirely saturated.

Now if this theory holds good, and if it is indeed essential that the bath should not be iodized up to saturation, it would follow that the immersion of half a dozen plates would be sufficient to spoil it, which is not the case; on the contrary, quite the reverse. For we all know that a bath may be prepared by simply making a solution of silver, and water, and leaving a plate in it all night. We also know that the solution greedily seizes the iodine of the collodion, and it is clear that the bath cannot be kept vascillating, so to speak, on the edge of saturation so long as one keeps on putting plates in it. May we not, then, assume that there is no such thing as an over-iodized bath, and that what is called over-iodizing is simply want of "l'argent" (impecuniosity, in fact), aggravated by too great an indulgence in alcoholic and etherial stimulants?

And this reminds me of the singular idea people sometimes get, and the extraordinary causes to which they attribute photographic failures. A French photographer once told me that he attributed most of his failures to impure protosulphate of iron, and that he had taken the trouble to analyze several samples, and had the greatest difficulty in finding one that was free from acid. It struck me as rather a profound thing at the time; but the next morning I said to him, "How do you prepare your developer?" and he gave me the usual formula. "Then what do you want your iron to be neutral for, if you mix it with a lot of acid before using?" and he said, "Oh!" and has since then ceased to bother on the subject.

To return to our silver bath. Elaborate and learned articles have been written about the importance of temperature, and most ingenious methods have been described for keeping the bath packed in ice in summer, and in hot water in winter, when, lo and behold! another man went to work and experimented, and clearly demonstrated that a bath heated almost to boiling point, and cooled little short of freezing, gave exactly the same kind of negatives in both cases; or, as the experimenter put it, "we are obliged to conclude that temperature has no perceptible effect on the working qualities of the silver bath." So, warm your dark rooms for your own comfort, but don't flatter yourselves you are benefiting your chemicals one particle.

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[*] A solution of tartar-emetic poured into the ordinary hydrogen-apparatus is equally effective for the preparation of the gas.

[†] Read before the Edinburgh Photographic Society.

[*] *Anthony's Bulletin.*

How many of the readers of the *Bulletin* will remember the painstaking way we used to make our collodion, and the painful anxiety lest a drop of water should get in more than was absolutely necessary for dissolving the sensitizer. Yet this morning I added half an ounce of water to a sixteen ounce vial of collodion, with the most enchanting result. The idea is not mine—I wish it was.

To return once more to the silver bath. Few photographers are aware of the importance of keeping a little strong solution of nitrate of silver to add to the bath. When the day's work is done, count up and see how many plates you have dipped in the course of the day, and, according to that, add your silver solution. By using a little judgment and discretion, you will soon learn to hit it off to a nicety, and it is amazing how long you can work your bath without filtering or touching it in any way. At least, that's how we do in South America; and I am thankful to say that I have found neither latitude nor longitude (any more than temperature) to have any effect on the working qualities of the silver bath.

Recent Patents.

IMPROVEMENTS IN CARBON PRINTING.

BY CLAUDE LEON LAMBERT.

The following is the text of M. Lambert's specification of his method of carbon printing, which he has designated *Chromotype*:—

This invention relates to the production of carbon photographs (viz., with salts of chromium) which are permanent, involve less than half the manipulation necessary for salts of silver pictures, and are produced returned in their true aspect, and gelatinized at the same operation. To this end I take a glass plate of suitable dimensions, upon which I first apply a greasy coating, and then a layer of normal collodion, after which I immerse it in cold water. I then remove from their printing frames the pigmented papers, and apply one on the coated glass plate whilst it is still in the bath. I then remove both together, glass and paper, and subject the same to slight pressure for a few minutes, after which I immerse in warm water to develop the positive print, which, according to the length of exposure, will serve either as a transparency—that is to say, a picture seen by transmitted light—or one seen by reflected light; it is upon this latter feature (the picture seen by reflected light) that the invention is based. The positive print having been thus developed, it is only necessary to immerse it in a bath of gelatine solution, containing from ten to fifteen per cent. of gelatine, and to apply the card mount, which is also passed through this bath. The picture is then allowed to dry thoroughly, after which it is detached from the glass, and remains as brilliant and glossy as the surface with which it was in contact. This brilliancy is not produced by the layer of gelatine, but by the image itself, which is completely insoluble, and will consequently bear considerable friction, and might even be wetted without its appearance or durability being affected.

By the above process a permanent image is obtained, which is itself preserved by an almost unattackable substance (insoluble bichromated gelatine—*i.e.*, the picture itself), and which is obtained in its true aspect—that is to say, non-reversed. Thus in practice it will not be necessary to have two poses to produce a pendant—that is to say, two portraits of persons face to face. The same result may also be obtained without transfer or detachment, and the picture be at the same time protected by means of a material not liable to be acted on by acids or heat, viz., mica, which can be cleaned in the same manner as glass, and will withstand rubbing. The picture obtained in carbon is developed on this definite support (mica), it being simply necessary to paste at the back thereof a sheet of white or coloured paper of the tint desired, and then to attach it, with paste or gelatine, to the card mount. In this manner the usual protecting glass of passeparteuts is rendered unnecessary, the mica, which is as flexible as the card itself, affording the necessary protection. If it is desired to have an ornamental ground or border of any kind, in imitation of marbling, leather, or otherwise, it is simply necessary to copy these designs, and obtain from the negative a number of prints in salts of silver for subsequent use, care being taken to cover the place for the carbon picture with an oval square, or round cornered mask, which part will thus remain white. By thus operating, the tint which it is desired to obtain may be harmonized by toning with the tint of the pigmented paper, which is effected at one and the same operation after development. The gradual strengthening which I apply to the salts of chromium consists of a solution of three hundred grammes of water, one drop of liquid ammonia, and one gramme of ordinary sugar of commerce, in addition to which, according to the desired intensity of the negative, I add a few drops of saturated solution of permanganate of potash. The negative obtained from a positive by transmitted light is then placed in this bath, and if it is desired to obtain still greater intensity, some more of the saturated solution of permanganate of potash is added. The negative thus strengthened will produce prints which are exact repetitions of the original. In this manner, also, the transparent positive may be intensified, in order to impart greater brilliancy to the negative to be obtained from it. I therefore claim this means of intensifying "clichés" obtained in salts of chromium.

I also claim obtaining prints in salts of chromium, on ordinary albumenized paper with borders, in a scale of different tints, which contrast with that of the picture. For this purpose I take ordinary albumenized paper of any quality, and expose it to light after sensitizing, then place it in the press, taking care to preserve a blank for the picture with a black or yellow mask, and in this manner I obtain an impression from a negative of any ornamental boarder, with a blank space reserved for the picture. I then precipitate with hyposulphite, and fix as in ordinary, and, if desired, apply it to the oval or square photograph. By this means I obtain on the same sheet two tints which harmonize perfectly, one for the picture and the other for the border. If, however, it is not desired to have recourse to this photographic process, I may lithograph on fine paper, of varied or graduated tint, any desired impression, such as a plain or ornamental ground; an oval or round cornered blank being left for the picture as before. Further, in order to give a fleshy appearance to bust portraits, I apply, either by hand or by lithography, before the application of the portrait, a graduated flesh tint over about two-thirds of the oval, whereby a most harmonious effect is obtained.

The following relates to an infallible method of retouching and intensifying the positive print obtained by the transferring processes hereinbefore described. By its aid any photographer, without possessing the least artistic skill, may, in the space of a few minutes, completely transform the appearance of the picture. The image in salts of chromium being obtained and developed as before described, after being alumed, is allowed to dry thoroughly. I then take a stump of suitable size, according to the effect which it is desired to produce, and charge it with powder composed of the tint required, and rub it over the surface, more or less, whereby a wonderful optical effect is obtained. The insoluble gelatine composing the image, after the repeated washings to which it has been subjected, presents a matt and imperceptible granular surface, and it is upon this dull surface, composed of myriads of invisible grains, that I apply broadly, at the back of the picture, the new powder, to impart opacity to those parts which require either modelling or darkening. No fixing agent is required, as the gelatine upon the mask being applied will serve to retain the powder, and render perfectly invisible the retouch which serves to harmonize the parts and improve the picture. The most beautiful coloured effects may also be produced by employing different tints, without the operator necessarily possessing any artistic skill.

Having described the nature of the invention and the manner of performing the same, I declare that what I claim as the invention to be protected by the herein-before in part recited Letters Patent is:—1st. The intensifying or strengthening bath, composed as herein specified, for obtaining clichés as set forth. 2nd. The method of obtaining the bordered support or ground in any desired tints or subjects on which the carbon picture is to be produced as specified.

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FADING OF SILVER PRINTS.

The recent discussion on the fading in silver prints has been fertile in suggestions as to the causes, or probable causes, at work. Until the causes of instability are discoverd it is, of course, hopeless to look for a remedy. Amongst the causes suggested are two, which it seems to us more nearly cover the ground than any others which have been from time to time named. These causes are the use of paper prepared with stale or decomposed albumen, as pointed out by Mr. H. P. Robinson, and confirmed in our last issue by Mr. Ayres, and the imperfect fixation inevitable from the mode of working adopted in many establishments where neither special economy nor carelessness are supposed to exist. These two causes explain the now commonly recognized fact that fading has been much more common of late years than it used to be. As regards the first, the use of stale albumen, the practice has been steadily growing of late years. Originated on the Continent, and found commercially successful there, it has been gradually adopted in greater or less degree in this country. Commercially it possesses two advantages—stale eggs are cheaper than new-laid or fresh eggs; and, what is of higher importance, a much finer and glossier surface is attained by the use of stale albumen than can be secured by employing it perfectly fresh. Photographers have had a craving for a fine surface, and albumenizers have felt it necessary to supply that which their customers demanded. Hence one fertile cause of instability had come into general use of later years.

A second, and probably still more fertile cause, is pointed out in the communication of Mr. Ayres. It is the cause which we have always held to be the most common source of fading: we refer to imperfect fixation. We have often insisted that the initial step in fading takes place in the fixing bath, rather than in the process of washing. No amount of careful washing is of avail if the mischief is begun in the solution of hyposulphite of soda. This mischief may be produced in a variety of ways; but, as a rule, two only are in operation in the modern practice of photography. In the old days a fixing bath of hyposulphite of soda was often used over and over again, being occasionally strengthened with fresh crystals. That practice, as well as several of a similar character, has long since been abandoned. No printer now dreams of attempting to fix prints in a solution of hyposulphite which has been used before. He begins with a new solution every day. The mischief, as pointed out by Mr. Ayres, is that whilst the early prints are fixed in a fresh solution, the later prints of a large batch fare very differently. The first few score of prints immersed are really fixed in fresh solution; but as fresh batch after fresh batch is immersed, the solution is rapidly getting saturated with hyposulphite of silver. It is true that when a few hundred prints have been fixed, a handful or two of fresh crystals of hyposulphite are added. But in many cases a decomposition has already been set up in the solution, the more readily if, as we have occasionally seen it, the fixing takes place in a room containing white light. Another cause of decomposition in the hyposulphite solution is the practice of transferring the prints direct from the toning bath to the fixing, without any intermediate rinsing, under an impression that as the toning bath is alkaline, there is no risk in its contact with the hyposulphite solution. There is a two-fold error in this supposition. In the first place, the gold bath, although commonly described as alkaline, is frequently not so. The most commonly used toning baths, the acetate bath, for instance—are really acid. In the next place, a solution of chloride of gold, apart from acidity, will produce decomposition in the hyposulphite solution.

If these two causes—the use of stale albumen, and an imperfect wholesale method of fixing—be proved to be the most fertile causes of fading, they are clearly preventible causes, and should be removed at once. That these are amongst the chief causes of the mischief, there is much evidence to prove. We have received many letters confirming the evidence already published. "An Old Amateur," referring to the action of albumen, mentions a case in which he treated a plain paper print, which had been produced some years, and was in perfectly good condition, with albumen to make it harmonize with some prints on albumenized paper. The albumen was a little stale, but not offensively so. The print, which was perfectly good at the time, was utterly destroyed in six months: yellow, faded, and worthless. A "Portraitist," in confirming some remarks by the "Old Photographer" in our last, mentions the fact, that about two years ago he found amongst his stores a few quires of old albumenized, with a comparatively slight glaze, suggesting the use of diluted albumen. He used some of it for large portraits, and these are all in perfect condition, whilst many prints produced at the same time on a modern highly albumenized paper have quite lost their virgin beauty. The experience of all photographers who have observed carefully seems to confirm this view. The remedy in this direction is plain. Most samples of paper which have been treated with decomposing albumen betray their history by their odour, and photographers need not, therefore, use it in ignorance. Further, let photographers deal fairly with the albumenizer, and be content with a reasonable surface, instead of demanding the gloss which can only be obtained by use of the albumen in an incipient state of decomposition.

Regarding the risks involved in the wholesale and somewhat undiscriminating mode of fixing described by Mr. Ayres, which it is to be feared is only too common, there cannot be a doubt as to the evils to which it gives rise. Every photographer's experience confirms it, and it scarcely needs reiterating after it has once been clearly pointed out. The remedy may not be quite easy, as, where large numbers are printed, it is difficult to induce printers to treat each one as a special individual of vital importance. Mr. Ayres describes his own system, which appears to be as easy to carry out as it is evidently intelligently devised. An intelligent knowledge of his work, and a conscientious feeling regarding it, are the best safeguards in a workman; but failing these qualities, or supplementing them, it would be wise if a definite system were adopted in every establishment of immersing a given quantity of prints into a fixed quantity of solution, and when these are fixed pouring the solution amongst the waste at once, never, under any circumstances, commencing the fixation of a second batch of prints in a solution which has been used. Some such plan should be made absolute. So also with washing: some efficient mechanical aid, such as sponging each print, or using heavy pressure to expel contaminated water after washing for a time, would be more effective than any amount of prolonged soaking.

As our readers know, various other causes have been alleged as tending to the common fading of silver prints, some of which are doubtless in operation, while others are, we think, imaginary. We cannot but think that Mr. Farringdon Lane is seriously in error in attributing fading either to weak baths, the use of nitrate of silver, or fuming. We may assure him, indeed, that neither Mr. Robinson nor Mr. Mayland, the gentleman by whom the re-discussion of the question was initiated, uses either ammonia fuming, nitrate of soda, or especially weak baths. The question of weak baths is a purely relative one, and must depend on the salting of the paper. A tolerably trustworthy rule has been found to work well: namely, that the silver bath should contain five times as many grains as the salting solution; and for most commercial paper, seven or eight grains of chloride of ammonia being used, a forty-grain bath is found sufficient. If a silver bath containing one hundred grains to the ounce be employed, either a much more highly salted paper must be used, or there is excess of nitrate, which is useless or injurious. There is no reason to believe that nitrate of soda is mischievous, whilst the fuming process is more likely to aid than to injure permanent conditions. Mr. Sedgfield, and other correspondents in the present number, suggest that economy of gold is a cause of fading, in which we agree. Mr. Sedgfield further points out that mounting agents play an important part in the question of permanency. In this also, as we have often before said, we fully endorse his remarks. He appeals to scientific experimentalists to give the question attention, and asks: Who will for a time abandon experiments in emulsions for experiments with mounting materials? Without underrating the importance of emulsion inquiries, we heartily second Mr. Sedgfield's appeal.

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MODE OF PREVENTING THE RAPID DRYING OF SENSITIVE PLATES.

At a recent meeting of the Belgian Photographic Society an interesting paper was read by M. Watrigant, who was of opinion that none of the dry plate processes in vogue at the present day were capable of giving pictures equal to those from wet plates. M. Watrigant proposed a method for maintaining the moist film in a wet condition for many hours, so that it would be possible for tourists, and others occupied in photography, to employ wet plates without having the trouble of carrying about with them a lot of solutions necessary under ordinary circumstances.

M. Watrigant's plan is to take the plate as it comes from the dipping bath, and to put round its margin an india-rubber ring, in such a way that the rubber laps over on each side. Upon this sensitized plate he now places a second one, similarly prepared, the two collodion films towards each other. The two are tightly fastened together in any way that may suggest itself, by string or some other means, and then one is in possession of a couple of prepared films sealed up hermetically. No injury can arise from the two plates pressing against one another, as the rubber ring forms a suitable buffer. M. Watrigant says that plates may be kept in a moist condition in this state for a period of forty-eight hours.

If it is considered undesirable to have a dark tent in which to separate the films before exposure, then M. Watrigant suggests that only the sensitive film should be sealed in like manner against an ordinary glass plate, and then an exposure may be made in the camera without inconvenience, due regard being paid to the thickness of the plates in the dark slide. The result in this case is not, however, so good as that secured when two prepared films are fastened together.

The landscape photographer, by adopting the Watrigant method, may spare himself the trouble of carrying collodion, silver bath, developer, and other solutions, and this is the object which the author desired to obtain.

◆

SILVER, CHROMIUM, CARBON.

(A Critico-chemical Comparison.)

BY W. HOWARD, ANALYST.

Chromium.

The group of metals to which chromium is allied by a general resemblance of its properties includes iron, cobalt, nickel, manganese, uranium, and chromium. All the metals of this group form several oxides, chlorides, and sulphides. Their affinity for oxygen is sufficiently strong to enable them to decompose water (when strongly heated), that element being absorbed by the metal forming an oxide, while the hydrogen is set free.

Metallic chromium appears to be the most infusible of all the metals, being (it is said) unaffected by a temperature sufficiently elevated to volatilize platinum.

By the action of sodium-vapour on one of its chlorides, chromium has been obtained in the form of bright crystals belonging to the cubic system; in this state it is not attacked by the strongest acids, either singly or in combination. It combines with oxygen in, at least, four proportions, forming :—

$$CrO$$

Chromous Oxide, or chromium monoxide.

$$Cr_2O_3$$

Chromic oxide, or chromium sesquioxide.

$$Cr_3O_4, \text{ or } CrOCr_2O_3$$

Chromous dichromic tetroxide, or chromo-chromic oxide.

$$CrO_3$$

Chromic anhydride, or chromium trioxide.

These chromium oxides are possessed of the most diverse characters, and afford a striking contrast to the silver oxides. The first two in the above list are basic, and combine with acids to form salts. The chromium monoxide is only known in the hydrated condition; it is most readily obtained by precipitation from the dichloride ($CrCl_2$) by the aid of potassium hydrate thus :—

$$\underset{\substack{\text{Chromium}\\\text{dichloride.}}}{CrCl_2} + \underset{\substack{\text{Potassium}\\\text{hydrate.}}}{2HKO} = \underset{\substack{\text{Hydrated}\\\text{chromium monoxide.}}}{CrOH_2O} + \underset{\substack{\text{Potassium.}\\\text{chloride.}}}{2KCl}$$

All the salts of the monoxide absorb oxygen with great rapidity; the dichloride is, indeed, perhaps the most powerful known reducing agent.

Chromic oxide or chromium sesquioxide is the basis of an extensive class of salts from which it may be obtained as a perfectly stable dark green powder by precipitation with ammonia and subsequent ignition, which expels the atom of water which is invariably combined with it when precipitated. It is also obtained by igniting the hydrated monoxide; two molecules of this compound decompose one molecule of their constituent water, evolving hydrogen, the other molecule of water being, at the same time, expelled thus :—

$$\underset{\substack{\text{Hydrated chromium}\\\text{monoxide.}}}{2CrO_2H_2} = \underset{\substack{\text{Chromium}\\\text{sesquioxide.}}}{Cr_2O_3} + \underset{\text{Hydrogen.}}{H} + \underset{\text{Water.}}{H_2O}$$

Chromium sesquioxide when thus rendered anhydrous is not attacked by acids, unless they are concentrated and warm. Chromium sulphate prepared from the ignited oxide will not combine with an alkaline sulphate to form a chrome alum.

This oxide is produced by many other decompositions, some of which will claim our attention later on.

The chromo-chromic oxide is a neutral body of small importance; it corresponds in composition with the magnetic oxide of iron—

$$Fe_3O_4, \text{ or } FeOFe_2O_3.$$

Chromium tri-oxide is the most important compound of the metal; it combines with a molecule of water, forming chromic acid, thus:—

$$\underset{\text{Chromium trioxide.}}{CrO_3} + \underset{\text{Water.}}{H_2O} = \underset{\text{Chromic acid.}}{H_2CrO_4}$$

This acid unites with bases to form neutral chromates and acid bichromates, thus:—

$$\underset{\text{Potassium monoxide.}}{K_2O} + \underset{\text{Chromic acid.}}{H_2CrO_4} = \underset{\text{Potassium chromate.}}{K_2CrO_4} + \underset{\text{Water.}}{H_2O}$$

If a chromate is treated with sulphuric acid, one half of the base is withdrawn, and a bichromate is formed, thus:—

$$\underset{\substack{\text{Potassium}\\\text{chromate.}}}{2K_2CrO_4} + \underset{\substack{\text{Sulphuric}\\\text{acid.}}}{H_2SO_4} = \underset{\substack{\text{Potassium}\\\text{bichromate.}}}{K_2Cr_2O_7} + \underset{\substack{\text{Potassium}\\\text{sulphate.}}}{K_2SO_4} + \underset{\text{Water.}}{H_2O}$$

Potassium bichromate is the basis from which all the other chromium compounds are usually prepared, and it and the corresponding ammonium salt are the agents utilized by *chromotype* printers.

Chromic acid and its salts are marked by properties which are the exact reverse of those exhibited by the monoxide and its compounds. The former act as powerful oxidising agents, the latter as powerful deoxidizers.

The effect upon the chromium compound is in both instances identical; the chromic acid, parting with oxygen, is reduced to the state of sesquioxide or sesquisalt; the monoxide and its compounds, absorbing oxygen, pass into the same condition.

The reduction of chromic acid or its salts to the state of sesquioxide or sesquisalt may be effected in various ways.

The application of strong heat decomposes chromic acid with evolution of oxygen, thus:—

$$\underset{\text{Chromic acid.}}{2H_2CrO_4} = \underset{\text{Chromium sesquioxide.}}{Cr_2O_3} + \underset{\text{Oxygen.}}{O_3} + \underset{\text{Water.}}{2H_2O}$$

The alkaline bichromates are also decomposed by heat, the ammonia salt at comparatively low, the potash salt at high temperatures. The products are sesquioxide, neutral chromate, and oxygen gas.

Hot and strong acids compose either the acid or its salts, producing a salt of the sesquioxide.

Chromic acid oxidises organic bodies very readily, the bichromates behave similarly. In the presence of light this disassociation of the bichromates proceeds very quickly, and is the basis upon which chromotyping is built.

The sulphides of chromium corresponding to the basic oxides are unimportant; they are not formed when sulphuretted hydrogen (dry or wet) is brought into contact with the oxides.

Possessing vigorous affinities and a series of salts of the most diverse character, *chromium* presents a strong contrast to silver with its one series of compounds, and its unconquerable tendency to unite with sulphur.

The chromium sesquioxide which is the basis of *chromotypes* cannot combine with the sulphur contaminations of the atmosphere, nor can it be reduced to the metallic state unless it is ignited with carbon at a white heat; besides these manifest advantages over its rival on the score of a stable basis, the *chromotype* has other chances of permanency which cannot be claimed for the *silver print*. These and other matters will be more appropriately treated of when the practice of chromotyping is under review.

(To be continued.)

CROOKES' RADIOMETER AND SELENIUM AS PHOTOGRAPHIC ACTINOMETERS.

BY CAPTAIN ABNEY, R.E., F.R.A.S., F.C.S.

A few days ago we undertook in our laboratory at Chatham some experiments with Crookes' radiometer, to ascertain if it had any value as a photographic actinometer. Both sunlight and the electric light were employed, and in both cases gave similar results. In the case of the sunlight the beam was directed by means of one of Spencer's small heliostats (a little instrument, by-the-bye, that should be in possession of any experimentalist who cannot afford a more expensive kind) through a slit in a shutter of our darkened room, and thence passed through two hollow prisms of 45° containing carbon disulphide. The spectrum thus obtained was focussed on a white screen by means of a convex lens three inches in diameter, and the visible portion measured about two feet in length. The radiometer was placed along all the portions of the spectrum, those not required being cut off by a screen with a wide slit in it, and only one class of ray was allowed to have access to the vanes. The following are the results:—

In the ultra red rays, where the maximum of heat is formed, the number of revolutions was 38 per minute.

In the extreme red ... ... 19 per minute
In the orange ... ... 4 ,,
In the green ... ... 1 ,,

In the remaining portions of the spectrum the vanes showed no signs of movement. With the electric light, as before stated, similar results were encountered. The radiometer was then removed from the spectrum, and in a nearly dark room one side of the glass was breathed upon, with the result that the vanes revolved rapidly in a certain direction, the blackened side of the pith being repelled.

Ice was next applied to the same side of the containing glass, and the rotation took place in an opposite direction. This class of experiments was varied, and they all gave similar results.

The deductions to be made, I think, are as follow:—The radiations, which we call heat, are effective in causing rotation; the radiations we call light are only effective in so far as they cause heat; the radiations we call actinism are totally ineffective. The hope that has been expressed that the radiometer can help us in photography is founded on false premises.

The earliest experiments on the known diminished electrical resistance of selenium when exposed to light were carried on in the Electrical School at Chatham, by Capt. Sale, R.E., and at which I was present. After those early trials, I communicated to the News the fact that the most increased action took place when the selenium was exposed, not in the actinic portion of the spectrum, but in the most luminous portion.

More recently, Professor W. G. Adams has repeated the experiments with more delicacy and greater precision, and the results he obtains are fully confirmatory of those obtained by Sale, from which we may deduce that, aa a photographic actinometer, the selenium will prove of but little value.

The radiometer and the electrical circuit, containing a mite of selenium, must both, therefore, be regarded as not increasing the power of mechanical improvements in photography, and other means should be looked for to obtain an actinometer which is sensitive to the rays of higher refrangibility.

PHOTOGRAPHIC TRANSPARENCIES.

BY DR. J. SCHNAUSS.*

At first photographic transparencies were produced almost exclusively for the stereoscope, and few were prepared of large size, except for the purpose of enlargements, although very fine light screens and illuminated windows can be secured in this way by putting the pictures upon some transparent basis, such as oiled or tissue paper. Just now, transparencies, or diapositives, have attained to greater importance through the carbon process, and it may not be without interest, therefore, to our readers to know the different ways of producing them.

The beautiful transparent glass positives of Ferrier, A. Braun and others, were nearly all produced by means of iodized albumen, with development by gallic acid, and the exposure was made in the printing frame. Many, like Edwards, coated the glass plate first of all with iodized collodion, and then, after washing, iodized albumen was applied, the same being developed with pyrogallic acid. As in all albumen-developing processes, it is necessary to have a strongly acidified silver bath (acetic acid) for the production of these diapositives. The whole process is very tedious and laborious, and the preparation of a transparency by means of carbon is simple child's play by comparison. Experiment has been made to produce pictures by means of iodized collodion without albumen, and these can be secured either by printing in a frame or in a copying camera. In the first case, a collodion dry plate is to be prepared; but you may be successful, with a little care, when operating with wet plates, which I myself have often employed with advantage. Only the light of a good petroleum lamp is necessary, which, by the aid of a concave mirror, that may be made from a cardboard cover, is concentrated upon the negatives, between which and the wet plate a few strips of thin cardboard are placed to prevent actual contact between the surfaces. The exposure is only for a few minutes, even when old collodion is employed for the purpose, and the development is conducted by means of pyrogallic acid.

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* *Photographische Archiv.*

Collodion dry plates prepared according to any of the usual methods, when exposed to daylight under a negative, require, as a matter of course, but a few seconds' exposure. The development in this case is undertaken with acid solutions; at any rate, I do not think such clear vigorous transparencies can be secured by alkaline treatment. All developed diapositives have the defect of a coarse precipitate of silver, and this becomes objectionable when a powerful developer is employed. Blacks of a much finer nature are secured by direct exposure, or by the collodio-chloride process or pigment printing. Whether the experiment has been made to apply to chlorised albumen to glass plates, and then to sensitize it and prepare diapositives therefrom, I do not remember; but I should think that pictures of but little vigour could be thus attained, which could only be rendered sufficiently apparent by an opaque basis. Whether in like manner collodio chloride could be made to form an emulsion with albumen and chloride of silver, such as could be applied, is an experiment still to be tried; but with the easy method of pigment printing before us, no one probably will care about doing so. Under no circumstances must developed transparencies be under-exposed, from the circumstance that the blacks become too opaque by the continued action of the developer, and the whole picture, if required for enlargements, is too hard; and, furthermore, there is formed a thin veil of precipitate, which has a most injurious effect. Pictures which have been sufficiently exposed in the frame appear very rapidly on development, and of a reddish-brown tone.

Collodio-chloride is especially employed in the preparation of transparencies. As there is no development in this case, you get much softer films of silver and more delicate pictures, which cannot, however, be well used for enlarging, as they are devoid of vigour, even when a double coating of collodio-chloride is applied to the plate. Sometimes, too, when a second application is made, the whole film leaves the plate in the form of a milky skin. If the plate is only coated once, which suffices for transfer pictures upon a white basis, the defect does not occur. To prevent the solarization of a collodio-chloride film, Monckhoven suggests treating the plates with ammonia vapour.

For the most part, these pictures require to be toned in a gold bath. As a basis for such transparent pictures, the so-called Alba plates have recently been recommended, which are metal plates covered with a layer of matt-white varnish, and which, by reason of their strength, are to be preferred to opal glass. It is not an easy matter to estimate correctly the right exposure of a collodio-chloride film in the printing frame, and it is on this exposure that the beauty of the print in a great measure depends. It is absolutely necessary to employ a photometer, as soon as some little experience has been gained, to ascertain the proper degree. A particular kind of transfer paper is also employed for the collodio-chloride process, although it is quite possible to prepare suitable paper covered with collodio-chloride, upon which the picture remains permanently. In this case the paper receives a preliminary coating of gelatine and albumen.

The pigment transparency, which may be considered the *ne plus ultra* for enlargement, comes next. This pigment tissue, necessary for the production of these pictures, must contain more colouring matter than that for producing pictures which are transferred to white paper, as these, if viewed by transmitted light, are far too weak and transparent. The colour itself is a matter of choice, but it seems to me that a reddish tone is most suitable for enlargements. The production of carbon transparencies is far easier and more certain than the other methods I have described, even those of chromotypes, or pictures covered with collodion, for the latter require, in order to separate them from the glass, a coating of wax, as well as one of collodion, neither of which is necessary if the picture is to remain on the glass. The operation of retouching is also more simple, as one need fear no dissolution of the colour in the subsequent washings. During the enlargement there is placed behind the diapositive an opal plate. The pigment transparency is very suitable for the magic lantern, and portraits executed by pigment printing have a telling effect, if exhibited in this way.

I may add to these notes that a photographer well known to myself mixes with gelatine fusible pigments, and, having developed his picture, transfers it to porcelain, where it is burnt. In the ordinary way the fusible pigments are dusted upon the moistened gelatine film, and they do not adhere to the exposed and insoluble portions of the image, and there is produced a positive from a negative, for which reason it is necessary to employ a positive to print from. If, however, as in the case I mention, the fusible pigment is mixed with the gelatine, then you may employ a negative for printing from.

CONCERNING FADING, AND OTHER MATTERS.

BY RUSSELL SEDGFIELD.

In stating my belief that photographs carefully produced were permanent, I stated my own experience. Writing on the spur of the moment, it was perhaps put too strongly. I have long known that photographers whom there is every reason to believe careful and conscientious have met with very unaccountable results, which none of the ordinary explanations suffice to explain.

And here let me offer an apology to Mr. Robinson and other country photographers for my disrespectful allusion to them. I dare say that he understood my meaning well enough, although he thought it necessary to ruffle his feathers a little. Will it be sufficient to say, further, that at the moment I quite forgot that I was myself a country photographer? It really takes too long, when making any simple statement, to add all the explanations, limitations, and exceptions. Something must be left to the imagination and good sense of readers. In the same letter, for instance, Mr. Robinson mentions a *foreign* paper, as if a few degrees of latitude or longitude would make a difference in quality.

Sergeant Perry's experience is not an exceptional one. It would be absurd for me to repeat to him all the stock answers about hypo, washing, &c. Before I could offer any suggestion I must watch the whole process from beginning to end, and even then might be unable to suggest a remedy. Instead of this, I will state what in my opinion are some of the principal points to be attended to

In the first place, then, the albumenized paper should be sufficiently salted. There has been too great a tendency for many years to reduce the quantity of salt, with the view of economising the silver, and we see paper advertised to work with a twenty-grain bath. If Sergeant Perry uses such a paper, his hundred-grain silver bath is of little service. We none of us now make our own albumenized paper, but are dependent on the manufacturers. Most of these will at once give an enquirer an idea of the quantity of salt per ounce. If they will not, try another shop. Eight or ten grains of chloride of ammonium is—judging by my own practice—a suitable average quantity. I prefer this salt, but if others are selected, their combining proportions should be remembered, and more than double the quantity of chloride of barium, for instance, taken. Fifty or sixty grains of nitrate of silver per ounce will answer well with such a paper, and I can see no advantage in using it stronger.

The gold bath has also been economised to too great an extent. Correspondents have written to brag of the number of sheets they can tone with one grain of gold—ten, if I remember right, in one case. Such a performance is not much to boast of. Years ago I have toned ten sheets without any gold at all, but do not recommend the method. Then comes the hypo. We have really heard enough on the subject for the present. Everybody has his kick for that sick lion. Surely, by this time, the conditions of working are sufficiently well known to all intelligent men, their real difficulty being to get assistants who can be trusted to do the work precisely as directed. For washing on the large scale, I have seen no machine that will quite supersede personal attention and the ten fingers.

Lastly, the print has to be mounted; and I must avow my belief that it is in this part of the process that fading is chiefly induced. I am surprised that amongst all our experimentalists so little has been done in this direction. Practically we have only two mounting materials, starch or paste, and glue. A few others are occasionally used: gum-arabic, gum-tragacanth, and india-rubber; the latter being scarcely suitable for wholesale use. I do not forget the card—very little seems to be really known about it. Now and then an unusually glaring case of bad card turns up; but generally its influence is too slow and uncertain for ordinary detection, and we must at present take the goods with which the makers provide us. We could very well spare a few emulsion workers for this department of enquiry. Will none of them lock up their messes for a year or two, and go in for a mounting material? I don't mean to be rude, and hope the emulsionists will not think it necessary to be down upon me for such a remark, but we have really had enough on that head of late, and a little change would be agreeable. I have neither the time nor the skill for such an enquiry, but may point out one direction which it has seemed to me it may take: it is, in some modification of the property of ordinary glue, which would render it less hygroscopic when dry.

Correspondence.

FADING OF SILVER PRINTS.

Sir,—Seeing several letters in your paper on the above subject, I take the liberty of addressing you to state my experience in the matter. I fully endorse all that Mr. Robinson states in your issue of the 24th inst., that the albumenized papers we get in the present day are greatly deteriorated to what we used ten or twelve years back, as I have prints by me printed so far back as that, and they are even better in appearance than those printed even so short a time as six months. But my chief object in writing is to point out what I consider to be another cause of fading, and that is the use of white enamelled mounting cards. Recently I had introduced two classes of work: one, my best finish, were mounted on those white enamelled cards (printed in gold) the best I could obtain from a first-class house. My other style of work, I termed ordinary, were mounted on plain yellow cards (not enamelled). Some few weeks back, on looking through a friend's album, I was astonished to see two of my C.D.V.'s. literally covered with spots. This led me to make further inspection, and, to my great disgust and humiliation, every print I find mounted on those white cards (with but little exception) are spotted and fading fast. I thought at first it was caused by the gilt powder on the back of the said cards, but I found prints mounted on cards of another colour, and not enamelled, although printed in gold, did not fade or get spotty. To be sure that the fault lay in the cards, and not through any negligence on my part, I submitted the said card to an analyst, who has pronouced it to contain sulphur; moreover, those prints mounted on what I thought to be an inferior card, I find are keeping well, and show no indication of spottiness or fading, whereas those on the white enamelled cards begin to spot and fade in four or five weeks after they have been sent to customers.

I am now fully convinced that the use of such cards is a fruitful source of those evils which have lately bothered us, and would suggest, before we abandon a process by which such beautiful results can be obtained, and pronounce it bad, that photographic societies should take the matter up, and investigate thoroughly as to the manufacture of albumenized paper, mounting cards, &c., and not leave ourselves to the mercy of ignorant (and perhaps, in many cases, unprincipled) manufacturers and dealers, who send out goods, not knowing or caring what injurious matter they may contain, but which, unfortunately, may ruin the reputation of the photographer.—I remain, sir, yours respectfully,

A Country Photographer.

[Our correspondent may rest assured that in the case he describes, the gilt or bronze powder printing on his enamelled cards is the cause of the spots. Of this he may satisfy himself by placing a newly produced print, fresh from the washing water, in contact with the bronze printing on one of his cards, and leave it there for a few days; at the end of which time he will probably find an image of the bronze letters on the print, in sulphide of silver. We have had no reason to doubt the fitness of enamelled cards for mounting, but without further knowledge of the cards in question we can offer no opinion upon them. It is possible that the white facing may consist of sulphate of baryta, and the analyst would find sulphur; but existing as a sulphate it would be tolerably harmless. Hyposulphite of soda exists in many cards, but it is in the cards themselves, not in the enamel.—Ed.]

Sir,—Much has been said of late about the instability of silver prints, and many statements made which would lead one to suppose that they are less stable of late years than formerly, and numerous articles have appeared from week to week in the Photographic News, pointing to the probable cause for their fading; but I think one important point has been lost sight of, viz., that formerly (say twelve or fourteen years back) it was generally the custom to carry the toning operations farther than is the rule of the present day. We formerly got a substitution for silver—or, rather, a thicker deposit of gold—which, in my humble opinion, appears to be less acted upon by the small amount of hypo that might remain after fixing and washing than a print that has been taken from the toning bath at an earlier stage, and for the purpose of procuring a warmer tone. I have by me a score or more prints made seventeen years back, for experimental purposes, a few of which I herewith enclose. The numbers 1, 2, 3, and 4 received the same treatment, being toned together, but removed from the bath at different stages of deposit, and throughout the remaining operation received the same treatment. You will see that Nos. 1 and 2 are still brilliant, and that the others, which were only toned to a brown colour, have the usual appearance of fading. I should like to hear of your experience on this point.—Your truly, Edward Hill.

[The specimens forwarded curiously illustrate our correspondent's position. We shall give the subject further attention.—Ed.]

Sir,—On the question of fading, may I be allowed to make one or two remarks? Seeing that the fact is admitted that *some* silver prints have remained unchanged, or nearly so, should we not endeavour to ascertain wherein lies the difference between past and present modes of working, as the more recent ones appear to be chiefly at fault?

In the process of toning, do we not substitute gold for silver? If so, the farther we carry it the safer the print, and, in that case, the present favourite brown tone would be especially dangerous, and we should return to the old fully-toned black. The paper used in the early days was Canson Freres', and similar close-textured papers. This, combined with the use of dilute albumen and the use of stronger silver baths, may have given a hard and more impervious stratum, which held a picture more largely consisting of gold. Surely no respectable photographer would now omit to exercise every possible care in washing, fixing, &c. Bromo.

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Proceedings of Societies.

Edinburgh Photographic Society.

An ordinary meeting of this Society was held in the Hall, 5, St. Andrew Square, on the evening of Wednesday, the 5th inst., the President, Dr. **Thompson**, in the chair. The minutes of previous meetings were read and approved.

Mr. R. H. Bow read a paper entitled "Further Notes on the Effects of Light on Pigments" (see page 169), and fully illustrated it by diagrams and experiments.

The **President** said the members were always very glad to see Mr. Bow's name in the billets, as his communications were always both interesting and valuable. The paper just read he thought was specially interesting at the present time, when so much was being said and written regarding the permanence of pigment printing. Of the permanence of carbon itself there could be no question; but it was now generally understood that it alone would not give a colour at all pleasing to the eye, and therefore it required toning quite as much as a silver print, and in consequence the permanence of a carbon print, as a thing of beauty at least, was really dependent on the nature of the colouring matter that was used to give the desired tone. He would strongly recommend all who were interested in carbon printing—and especially those who were engaged in the manufacture of carbon tissue—to carefully study both the paper read by Mr. Bow to-night, and the one previously read on a kindred subject.

Mr. **Norman Macbeth** said there could be no doubt of the value of both of Mr. Bow's papers to carbon printers, and they were equally interesting to artists, to whom the question of the permanence of the colours was of the utmost importance. In all such experiments it should be kept in mind that colours were not always what they were represented to be, but were frequently combinations intended to produce the same effect, and in such cases it would be evident that the results could not be depended on. He quite agreed with Mr. Bow that the medium had considerable influence on the permanence of pigments, but to get its full effect they must be thoroughly incorporated. He had for some time been using as a medium and varnish a preparation of linseed oil, with which he was very much pleased. The ordinary oil was kept at a high temperature—roasted, he might say—for a long period, until, on cooling, it could be drawn out in threads. In this state it dissolved readily in turpentine, and formed both a medium and varnish of great value.

Dr. **Nicol** then exhibited and explained the construction and peculiarities of a tent for field work, manufactured and sent for exhibition by Mr. Bainbridge, of Barnard Castle. The tent, when packed for travelling, measures six feet eight inches by eight inches, and weighs twenty pounds. It consists of four circular poles or legs hinged to a wooden crown, and kept apart, when erected, by stays of stout iron wire a little below the middle. On the stays are suspended pockets for bottles, &c., and it is covered by three piles of twilled calico, two black and one yellow. There are no internal fittings of any kind, the operator sitting on the box or basket in which the chemicals, &c., are carried—an arrangement much more convenient than in tents fitted with a shelf and usual appliances. The tent can be put up or taken down in a few seconds, and, therefore, may be removed from place to place with the greatest ease.

Mr. **Wm. Neilson** thought the tent was a really first-rate article for those who wrought large plates in the field. Its construction was so simple that there was nothing to get out of order, and it was rigid enough to stand unshaken in the stiffest breeze in which a photographer could hope to work successfully.

The **President** said that the outer covering should be made of waterproof material, as if a shower were to come on, and the cloth get soaked, it would be exceedingly heavy and troublesome; otherwise the tent seemed very good indeed.

Mr. Ross considered the absence of any attempt at ventilation a serious drawback, as he was quite sure that any one working in it for five minutes on a hot summer day would not care to repeat the experiment.

Mr. **Turnbull** was very much pleased with the simplicity and convenience of the tent, especially for the working of large plates. For anything under 12×10 it was, perhaps, just large enough and heavy enough. Mr. Geo. W. Wilson, of Aberdeen, had wrought for many years in a tent of very similar construction, but not much more than half the size, and found that it answered his purpose admirably.

Dr. **John Nicol**, in reply to Mr. Ross, said that he had for more than a dozen of years wrought in a Smart's tent without feeling any inconvenience for want of ventilation. It was provided with a ventilator, but he had not been in the habit of using it, as he found if the cloth which covered the entrance was thrown back during exposure, the tent was kept fully supplied with fresh air. He had several times tried Mr. Bainbridge's tent, and liked it very much. The President's suggestion of a waterproof cover would be an improvement, but it would add much to the cost, which was a serious consideration. He thought that possibly the end might be gained by giving the outer covering a good rub with solid paraffin.

Mr. **Dallas** then laid on the table a negative and several prints from it, which he designated a photographic puzzle. He said that for some time a series of experiments had been made in the Natural Philosophy Laboratory of the University in photographing various spectra, and that while trying to get the spectrum of the electric spark the negative on the table had been produced. In the centre of the plate the spectrum proper appears, but above it and a little to the right there is an abnormal image which appeared on the plate only, although a great number of the plates had been exposed and developed under identically similar conditions. A print of the abnormal image shows a minute dark centre or nucleus. This is surrounded by a ring of light, and from that there radiates a series of regular streams of light terminating in brush-like markings, the whole radii being intersected by a series of faint but distinctly visible consecutive rings of light and darkness.

The negative and prints were examined with much curiosity, and several suggestions were made, but nothing like a satisfactory explanation was elucidated.

Dr. **John Nicol** then laid on the table a series of negatives which had been sent by the Rev. Mr. Palmer along with a short paper, which may be considered supplementary to that read at the last meeting of the Society (see page 172). The negatives, which included landscape portraits, were much admired, and seemed to give encouragement to several members who had been experimenting with gelatine, but who had utterly failed to get sufficient intensity.

Mr. **Mathison** was very glad to have an opportunity of seeing Mr. Palmer's negatives. He had experimented a good deal with Kennett's pellicle since Mr. Palmer's last paper was read, and while he found the plates extremely rapid—much more so, indeed, than wet collodion—he had utterly failed to intensify them, and had almost resolved to abandon the process. He should, however, try and try again, and should take advantage of Dr. Nicol's offer to give him some of the plates so kindly sent by Mr. Palmer.

Mr. **Turnbull** said his experience was like that of Mr. Mathison. He had tried the plates on portraits in his studio, and found them more rapid than his wet collodion; but the thin image absolutely refused to take sufficient density to make printing possible. Mr. Palmer's negatives, however, proved that the process could be wrought, and that most successfully; and he should also try some of the plates so kindly sent, and go at it again.

Votes of thanks were then given to Messrs. Bow, Bainbridge, and Palmer, and the meeting adjourned.

Photographers' Benevolent Association.

The Annual General Meeting of this Association was held on Thursday evening last, at 174, Fleet Street. The Annual Report of the Board of Management was taken as read, and after an animated discussion was adopted. The officers and Board of Management were re-elected for the ensuing year.

A petition for relief was presented from an operator who had been relieved previously by the Board of Management, the Secretary explaining that by the rules the Board were not allowed to relieve a second time within twelve months without the consent of the members at a general meeting.

The applicant was not a member of the Association, and as the board had recently closed the funds against non-members, the meeting decided "that the decision of the Board of Management closing the funds against non-subscribers should be upheld, and that as so short a time has elapsed since the previous grant of relief, this application should be rejected."

The members present were asked by the Secretary to furnish him with the names and addresses of all photographers they could, so that he might be able to well circulate the annual report.

After the transaction of some routine business, and after the usual votes of thanks, the meeting adjourned.

Talk in the Studio.

The Stereoscope as a Civilizer.—A "Quaker among the Indians" wishes that a good stereoscope, with suitable pictures, could be exhibited in every Indian camp, and properly explained to the people—the effect of an exhibition of stereoscopic views among the Comanches being, according to his experience, most amusing, as well as extremely salutary. "As a body, the Indians who have never been East, and, as a consequence, have seen but few white people, are disposed to disbelieve the accounts they receive respecting their numbers, the magnitude of their towns and cities, and the extent of the country they occupy. They believe that their own people who have been East have been duped by some kind of sorcery, or, as they would say, 'medicine.' They also think it is impossible to make an imaginary picture. Hence a picture is to them 'proof positive' of the existence of an original. Consequently, exhibiting towns, buildings, rural scenes, and soldiers has had a most convincing effect. This was much heightened by having some mountain scenes from Colorado, familiar to them, and which they recognized at once. This was, in fact, the strongest adducible evidence that the accounts they had received were so far from being exaggerations that the half had not been told them. One middle-aged man, who had always treated these reports with the utmost scepticism, was particularly struck with them. He could not sufficiently express his surprise, but beat upon his mouth in utter astonishment. Sun Boy, who had often told him what he saw in the East, would say to him in Kiowa:—'What do you think now? You think all lies now? You think all chiefs who have been to Washington fools now?' Again and again would he look them over, with his hand upon his mouth, dumb with amazement. After he had looked them over several times, being a war chief, he called in his warriors, and exhibited the pictures to them, talking to them all the time. I could understand but a part, yet would gather such expressions as these:—'Look! see what a mighty powerful people they are!' meaning white people. 'We are fools! We don't know anything! We just like wolves running wild on the plains!' Such an effect on the war chiefs and warriors cannot but be very salutary, and must conduce much towards deterring them from going on the war path against such a 'mighty powerful people.'"—*Scientific American.*

To Correspondents.

Beginner.—The use of very dilute albumen to plates (say the white of one egg in a quart of water) will not be injurious to a bath, provided care is taken to keep it from the back of the plates. But if the albumen be suffered to run over the edges and back of the plate, the bath will gradually become contaminated. 2. Buff curtains or screen for a background will answer, but probably a little too light. 3. As a rule, prints placed in plain water before toning do not change colour, but, of course, all prints look redder when wet than when dry.

Transfer.—Use a tough collodion, and, after fixing and washing, place the negative for a few minutes in a very dilute solution of citric acid, which will quickly loosen the film. Then take a piece of thin tough paper—something of the quality of tracing paper answers well—and cut it a quarter of an inch each way less than the glass; lay it on the film, and turn the edge of the film down on the paper. It may now be lifted from the glass and transferred to any surface which may be desired. The surface to which it is desired to transfer the film should be previously treated with a thin dilute coating of gelatine.

Perseverance.—A folding screen with wings and top of about five feet will aid you in getting good results; but sometimes it is necessary to have means of cutting off or limiting front light as well. 2. A well exposed collodion positive may be intensified in various ways sufficiently for use as a negative. One of the simplest consists in first treating with a 5-grain solution of bichloride of mercury until the image is of a uniform grey tint, then washing and applying a 1-grain solution of iodide of potassium. 3. It depends on the weather. In summer, cold; in winter, tepid. 4. We do not know any work with more definite instructions. The swansdown cotton was faulty; not the instructions. It should not have had any chalky dressing. We never met with any such. A sensitive plate may often, with advantage, be used as a ground glass screen.

Lights and Shadows.—Shellac is dissolved in wood naphtha or methylated spirit, about one drachm to the ounce of solvent, and then can be applied with a brush. If one coating be insufficient, a second or a third may be tried. 2. Photographs are registered at Stationers' Hall, a proper form being duly filled up and signed by the photographer. Personal attendance is necessary, and the cost is thirteen pence. Should you not be able to attend personally, send a copy of the photograph, with full particulars and eighteen penny stamps, to our Publisher, who will attend to the matter for you. Thanks for suggestions.

Amateur.—It is somewhat difficult to form any definite idea of the lighting in the negative from a weak, imperfect print; but, so far as we can judge, there is too much evenly diffused light, and a lack of concentrated light from one direction sufficient to give well-marked light and shade, and consequently the modelling and relief are imperfect. The colour of the print is not good; it is too pale and light in tint. This may be the fault of the tissue; but it is probable a good deal is due to the use of a thin, weak negative. It resembles the Lambert prints in so far as it has a glazed surface. The manipulation of the printing appears to be good.

Amateur No. 2 (Sydney).—It is better to keep the nitrate bath in the dark, except when you wish to sun it. If it be submitted to the action of daylight for a short time, an action is sometimes set up which will cause fogging. When a bath is subjected to the action of light at all, it should not be removed until that action is completed, and all foreign matter precipitated. 2. Toning and fixing are best conducted in a dark room. It is difficult to distinguish at times the precise tone by yellow light, although an experienced eye will materially aid you. With care, however, a hasty glance in a subdued white light will do no harm.

R. P.—We are uncertain of the precise strength of nitric acid used in the American Pharmacopœia. It is, probably, similar to that of the B. P., which is 1350. We do not know the composition of the powders specially named; but a powder of the kind, giving, when fired, a momentary flash of intense actinic light, may be made by mixing four parts of chlorate of potash, two parts of sulphur, and one part of sugar, all in fine powder. We do not know of any difference in the plates named; and, so far as we know, all details of preparation have been published. Have you carefully tested the prepared plates with others prepared by the published formula?

An Old Albumenizer denounces photographers for running after paper of foreign manufacture, which is manifestly prepared with stale albumen, and then denouncing modern albumenized paper generally, as conducing to fading. He says that many English albumenizers have been driven to the use of stale albumen to obtain the surface which their customers insist upon having, and states that if photographers will refuse paper so prepared, they will find albumenizers very glad to supply an article which they know well is most conducive to permanency.

Midland Photographer.—The black spots on your sensitive paper are probably due to particles of protosulphate of iron, in the form of dust, having come into contact with it.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. Amey, Landport,
Two Photographs of William Stokes.
J. C. Hale, Plymouth,
Photograph from Drawing entitled "The Return from the Plough."
Mr. Groom,
Photograph entitled "Client and Counsel."

The Photographic News, April 21, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

The Warnerke Film—The Entirely New System of Photography—The Royal Society.

The Warnerke Film.—Landscape photographers, and tourists especially, have, for some time past, been casting longing eyes at M. Warnerke's paper films. The roller dark slide and the dry emulsion are such a tempting bait to the photographer who works out of doors, that one cannot be surprised if travellers leave the dark tent and plate box behind them, and carry in lieu an endless roll of the sensitized paper. Unfortunately we have not yet been able personally to experiment with the film and the new apparatus; and although we are quite convinced, from the way in which we saw M. Warnerke pursue the manipulations, and from the facility with which he obtained his results, that the process is a practical one of considerable value, still one can hardly feel altogether satisfied until one has had an opportunity of working for oneself. The difficulty which seems to be most troublesome is the construction of the roller slide, for it must be obvious to all who understand its action, that one must be able to rely implicitly upon the apparatus acting with unerring certainty, if we are to rely upon it for one negative after another. We can well understand that such a piece of apparatus is not to be designed in a day, for when one comes practically to work an instrument there are many defects met with that were not observed in theory. M. Warnerke does not propose now to have any backing at all to his emulsion film, which will be rolled off one roller and on to another, for he has found that it can be produced quite as strong and tough, almost, as when it is supported by a paper backing. The light grey film will simply be produced in considerable lengths, and put into the roller dark slide and exposed, piece by piece, as the rollers are turned. Two objects require to be fulfilled with considerable nicety in doing this: first of all, the beginning and the end of each negative, in the roll, must be marked; and, secondly, it is necessary that the film should be at perfect tension between the two rollers while it is being exposed; for if it should bulge, or, what would be quite as bad, be strained so as to have creases, then, of course, the negative will be irretrievably spoilt. No doubt, M. Warnerke will be able to overcome these difficulties as he has no less formidable ones which beset his path, and as he has promised to forward us one of his dark slides, as also some tissue at an early opportunity, we hope, before long, to give our readers the result of our personal experiences. As the summer days are now rapidly approaching, there is little time to spare, if the Warnerke process is to be generally adopted this year, and we hope, therefore, that nothing will stand in the way of its being at once put before the public.

The Entirely New System of Photography.—Taking all things into consideration, we do not think that antimonietted hydrogen will ever be adopted practically for photographic printing. Indeed, when we called our readers' attention to the peculiar reaction in these columns, some days before the matter was brought to the attention of the Photographic Society, it was not to suggest its practical adoption by photographers, but to place on record a circumstance which was interesting to all engaged in chemistry and photography. The deadly poisonous nature of stibine, by which name the gas is usually known, would alone preclude its introduction into the studio. For although the photographer has to do with many poisonous compounds, in the shape of cyanide of potassium, pyrogallic acid, bichromate of potash, &c., these are as nothing compared to a gas of which a single cubic inch is said to be sufficient to poison a man in fifteen minutes. We do not think that, under these circumstances, photographers will be in a hurry to get antimony photographs, more especially as, when obtained, they seem to possess not one single qualification to recommend them. As Mr. Bedford pointed out, there seemed to be an absence altogether of half-tone, and as yet there is no reason to suppose that we shall be able to obtain anything but a silhouette by means of such a process, a result which may be secured quite as well in many other more harmless ways. Indeed we cannot help thinking that this experiment, or reaction—for it is little more—was put before the Photographic Society with far too much circumstance; and it would have been better, instead of pompously announcing "an entirely new system of photography," to have adopted the more modest title of the author of the paper when he came to read it, "Note on the Production of Antimony Photographs." We do not know who is responsible for such a step, but we hardly think it wise to herald forth a communication which, after all, appeared in all its details the previous week in these columns. Moreover, the announcement that "an entirely new system of photography" was to be divulged led members to criticise the paper from a practical point of view, as if the reaction in question were, in fact, a process seriously put before photographers to adopt, thus setting the question altogether upon a false basis. Mr. Francis Jones, of Manchester, seems to have discovered a singular reaction, to which it was well worth while calling the attention of the Photographic Society in the few words made use of by the author of the paper; but we should hardly have thought that any one acquainted with photography would have described it as "an entirely new system of photography."

The Royal Society.—The names of the fifteen candidates selected from the fifty by the council of the Royal Society for election into that august body have been announced; and although we did not claim to be prophets when speaking on the subject the other day, we congratulate our readers and ourselves upon the selection at least of one name. We said that Captain Abney's chance of election was a very good one, and we are happy to find that his name heads the list of those whom the Council recommend for election. As this is tantamount to the fact of their being chosen by the Fellows subsequently, who invariably follow the advice of the Council, it may safely be predicted that by the end of May Captain Abney will be entitled to put the much-coveted letters, F.R.S., after his name. We congratulate him on his honours, and our readers, who have known him as a sound and ardent investigator of photographic science for years past, will agree with us in saying that he has well earned the blue riband for which he has been striving. Dr. Armstrong, one of the secretaries of the Chemical Society, is also among the chosen fifteen, as also Mr. Dunkin, of the Royal Observatory, and Mr. T. E. Thorpe, Professor of Chemistry at Leeds. Among the other scientific men selected we are glad to see Dr. Ferrier, of King's College, whose researches upon the brain are among the most valuable of modern investigations. A remark has been made that there has been seldom so many "Sirs" seen among candidates for election to the Royal Society as in the present year; we note, however, that among the fifteen fortunate candidates there is not a single one, on the present occasion, with a handle to his name.

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MY EXPERIENCE WITH THE NEW COLLO-DEVELOPER.

BY WILLIAM BROOKS.*

I find there has been a mistake in the announcement of this paper in the last issue of the photographic journals, which would lead many to suppose that it was a collo-developer of my own invention I was going to bring before your notice, whereas it is the one that was published by Mr. M. Carey Lea, of Philadelphia, in the *British Journal of Photography* for March 3rd last.

I have tried, I think I may say, all the gelatino-developers that have been in vogue for the past ten or twelve years; and to me they all seemed to give negatives of excellent quality, both in the wet and dry processes—in the dry process, especially, where the addition of nitrate of silver has to be made to the iron developer. With a properly-balanced developer (with gelatine) it gives negatives of great perfection. The negative I now pass round was taken ten years ago by a dry process I was then working. It was developed with a weak iron developer with Beaufoy's acetic acid and gelatine added, and I think you will all agree with me when I say I consider the negative quite perfect.

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* Read before the South London Photographic Society.

With the wet process I found this developer was at a great disadvantage; the exposure had to be considerably prolonged, and if the plate were at all under-exposed it gave prints which were very hard and wanting in detail. Another disadvantage was that, sometimes, after a negative was washed and dried, on varnishing it would become covered all over with white opaque spots. I think this was owing to some portions of the gelatine clinging to the collodion film. But with all these troubles there was something about the deposit—being so regular and fine—that I could never give up gelatine entirely, and always use it where I can.

When I read Mr. M. Carey Lea's article, I thought it was quite impossible to compound a developer to work by the formula he had put forth. I at once set to work and made the quantity given, working it out to the very letter. A sample of the product I now pass round. I then made up twelve ounces of a fifteen-grain iron solution, to which I added four drops (according to Mr. Lea's instructions, dropped from a glass stirring rod), added alcohol as usual, and filtered, being very careful not to add more of the restraining agent than was prescribed. Mr. Lea calls particular attention to this. I prepared a plate in the ordinary way, exposed, and I *will not* say developed it, but tried to do so, but no image appeared. I kept the developer on the plate two or three minutes, when a lot of dense opaque spots and comets began to appear and expand, and then I could just make out certain portions of the image. I thought this kind of behaviour very peculiar; certainly it was a restrainer with a vengeance—far stronger than any of the known mineral acids. I tried with several samples of collodion—still, nothing but spots and comets. I made up fresh developers with different samples of iron; still the same results. I put the developer away for a day to rest; on looking at it the next day I found a very dense powder at the bottom of the bottle. I tried another plate or so, with results a little improved. I gave it another two days' rest after filtering out the deposit, which was of a very brilliant colour on the filter—brighter than ordinary oxide of iron. After letting it rest about three days in all, I tried several more plates, and neither comets nor spots appeared. The image came out this time. I gave about the exposure I should under ordinary circumstances, but found the exposure was insufficient. There was perfect freedom from fog, showing that too much of the restraining element had been added.

I made another lot of developer, adding this time one drop of the restrainer to five ounces, and let it rest for three days. I again exposed a plate, and gave again an ordinary exposure. On application of the developer the image instantly flashed out, giving signs of over-exposure. I tried several other plates with reduced exposures, and I found then that Mr. Lea had far underrated the restraining power of this curious compound, and that it gave a developer not only that would permit of shorter exposure, but one that gave results far superior to the ordinary developer restrained with acetic acid, and without the drawbacks that I mentioned in the former part of this paper.

There is one thing I noticed in particular—that if the developer be left to stand in a bottle without a cork for weeks it does not change colour; it remains quite as clear as water, and seems to improve by age. The sample I now hand round has been made one month, having been kept in a bottle without a cork. I also submit for your examination two negatives taken as trial plates. The one marked "twenty-five seconds" was developed with an ordinary fifteen-grain iron solution, restrained with fifteen minims of glacial acetic acid—Mawson's ordinary bromo-iodized collodion being used. The lens employed was a rapid rectilinear, by Dallmeyer, eight and a quarter inches equivalent focus—the smallest stop being used to prolong the exposure. The plate marked "twelve seconds' exposure" was prepared under precisely the same conditions; exposed the twelve seconds, and developed with a portion of the same sample of developer I have just handed round, the formula standing thus:—

Ferri protosulphate	75 grains
Collo-restrainer	1 drop
Water	5 ounces
Alcohol	*Quant. suff.*

I will leave you to judge as to the value of this developer as regards exposure. It also seems to have the properties of formic acid combined with qualities of the gelatine, giving a dense deposit and very fine.

I have a host of experiments in hand which at present seem very promising, and hope at some future time to bring them before the Society.

The only disadvantage with this developer—if it can be called such—is having to make it up two or three days before use. Perhaps the weather, as it gets warmer, may obviate that. The relation of the restrainer, with the formula I have just given, to the best glacial acetic solid at 50°, as regards strength, stands thus:—One pint is equal to seventy-five parts of glacial acetic acid. One pint of glacial acetic acid is sufficient to make 640 ounces of developer, whereas one pint of this collo-restrainer will make 48,000 ounces, equal to 300 gallons of developer, according to the formula I have been using; and I still have good reason to believe that it will bear further dilution on account of the absolute freedom from fog. I have tried it as a restrainer for pyrogallic acid, but I find that it decomposes it.

In conclusion, I will restate Mr. Lea's formula as published in the *British Journal*:—

French glue	6 ounces
Sulphuric acid	6 fluid drachms
Water	9 ounces.

Mix the acid and water together. First dissolve the glue in this acidulated water; when perfectly dissolved add three more ounces of water, and boil in a flask for two hours; at the end of that time add one ounce of granulated zinc, and boil again for one hour and a-half longer, set aside to cool, then strain. I think all photographers who take up this valuable piece of information that Mr. Lea has so generously given to the world will have every reason to thank him. I consider it one of great importance, and one of the best developers that has been published for many years past. I shall be very pleased to hear if Mr. Lea's experience is the same as mine as regards the developer having to be made about three days previous to using.

PHOTOGRAPHY AS APPLIED TO ECLIPSE OBSERVATIONS.

BY ALFRED BROTHERS, F.R.A.S.*

Since 1860, when photography was first applied to eclipse observations, almost every eclipse of the sun has been photographically recorded—from 1860 to 1868 for the purpose chiefly of determining the nature of the red prominences; and in 1870 and 1871 to ascertain whether the corona is an appendage of the sun or an effect produced in our own atmosphere. Previous to 1870 the ordinary telescope, uncorrected for the chemical rays, had been almost exclusively used. But in 1870 it was determined to adopt a properly corrected photographic lens, and by a graduated series of exposures to obtain, if possible, the whole pictorial effect. This method was successful, and has been adopted in all eclipse work since. That more suitable apparatus has not been employed may be due to the fact that the funds provided by the Government, the Royal and Royal Astronomical Societies, for the observation of the various eclipses have either all been spent at the time, or the balances have been returned. As good work has been done with the apparatus referred to, it may be asked why anything different should be used. It was by mere accident that a lens of a certain kind was used in 1870, no other suitable was to be had, and the image obtained with it is small. Photography was not employed during the eclipse of 1874, almost the only observer on that occasion being the Astronomer Royal at the Cape of Good Hope, Mr. Stone, who observed with the spectroscope under the most favourable conditions, and it is much to be regretted that no photographs were obtained. On the occasion of the recent eclipse no preparations were made until the invitation from the King of Siam was received, and then, as on almost every occasion since 1868, all arrangements have been hurriedly made. No apparatus for obtaining a picture of the corona different from what has been previously used was employed, and consequently no superior result may be anticipated. The lenses used in 1870 and since for photographing the corona give an image of the sun of about three-tenths of an inch in diameter, and although suitable for small pictures, such lenses cannot be said to be the best for the purpose. I would suggest, therefore, that at least three achromatic lenses of five or six feet focal length, corrected for the actinic rays, should be constructed, with all suitable apparatus, so as to be ready for use when required. The light of the corona is sufficiently actinic to produce good pictures when an instrument of long focus is used—it is only a question of time in the exposure and accuracy in the adjustment of the driving clock apparatus attached to the equatorial mounting. There cannot, I think, be any doubt that under favourable atmospheric conditions some features of interest would be revealed during every eclipse, and it is undesirable to allow any eclipse of the sun to occur without some attempt being made to record such phenomena permanently by means of photography. It seems to me also equally certain that pictures of greater dimensions, such as the instrument suggested would give, would be proportionally more valuable than any hitherto obtained.

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* Read before the Physical and Mathematical Section of the Manchester Literary and Philosophical Society.

The photographic process used has always been the wet collodion. It might be advantageous to use daguerreotype plates, but I see no reason why both methods should not be employed.

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THE HISTORY AND SENSITIZING CAPACITY OF A NEGATIVE BATH.

BY R. GILLO.

[It will be remembered that at the last meeting of the South London Photographic Society, the question, "How many plates of given size can be sensitized in a bath of given capacity?" was raised, and Mr. F. York promised to bring some statistics to the next meeting. The following paper by Mr. Gillo was read by Mr. York in redemption of his promise.]

A twelve by ten glass bath, holding about eighty ounces of new solution 35 grains to the ounce, and made with distilled water and three drops of nitric acid, did 213 plates 7½ by 7½ inches, being about 60 square feet. It gave up suddenly, needle-like crystals being formed all over the plate, on the inside of the bath, and on the dipper. Before this point was reached, the plates developed very weak, and there was difficulty in getting the developer to stay on the plate. The developer was

Saturated solution of iron ...	4 ounces
Methylated spirit	4 ,,
Glacial acetic acid	4 ,,
Bottle filled up with water ...	80 ,,

Now that nitrate of baryta is used in the bath (ten or twelve drops of saturated solution in a 12 by 10 bath) probably more plates could be done, but it is usual to discontinue the use of the bath as soon as it is found difficult to keep the developer on the plate; probably about 170 or 180 plates may be done before this happens. A bath holding 80 ounces of solution 35 grains to the ounce, when it was discarded as worn out, was found by the argentometer to register sixteen grains; it had also diminished in quantity nearly one-third. The number of plates sensitized in it was about 180 7½ by 7½.

Quantity of silver at first	2,800 grains
Quantity in the bath left	880 ,,
Quantity used	1,920 ,,

Practically about ten grains a plate, about a pennyworth of silver, or threepence a square foot. With a bath made of new silver and water, the plates at first come beautifully bright, but rapidly a surface fog accumulates, which gets worse and worse every plate that is put in the bath. When this occurs, the bath has to be taken out, and a few drops of a saturated solution of baryta added, and stood in the sun for a day or two, when a deposit takes place, and after filtering, the surface fog never appears again. In the former case, when the surface fog is rubbed off, the film under is bright like bare glass, whilst in the latter, after the addition of the baryta, the film is granular, looking something like very fine ground glass. The glass plates are all albumenized before coating with collodion; probably this has something to do with it. In every case, the development is pushed to the utmost. The fog here spoken of would not be noticeable in a negative, nor the granular film; but in the case of transparencies for the lantern, where absolutely bare glass is needed, it is very obvious.

Adding more nitric acid to the bath did not diminish the surface fog, nor the granularity of the film. Adding iodine to the collodion did tend to clear the film, particularly the granularity, but did not remove it unless an enormous quantity was added, making the collodion quite dark, in which case the exposure was very much lengthened, and the resulting image very weak. The best result was obtained with the collodion a *dark sherry* colour.

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PHOTOGRAPHIC CHEMICALS AS PASSENGERS' LUGGAGE.

A charge was made at the Bow Street Police Court, on Saturday, against Henry William Johnson, 36, merchant, of 22, Bow Street, on a warrant granted by Mr. Vaughan, with unlawfully attempting to send away in a British ship, the *Bokhara*, certain dangerous goods, without distinctly marking their nature on the outside of the packages, and without giving written notice of the nature of such goods to the owner of the said ship, contrary to the Merchant Shipping Act of 1873, section 23.

Mr. Poland prosecuted on behalf of the Peninsular and Oriental Steam Navigation Company; and Mr. George Lewis defended.

The former gentleman said the offence alleged against the prisoner was created by the 26th and 27th Vic., cap. 85, sec. 23, which provides that if any person carries, or attempts to carry, on board any vessel naphtha, lucifer matches, or any dangerous materials, without distinctly marking their nature on the outside of the packages, and without giving written notice of their nature to the owner or master of such vessel, he shall be liable, for every such offence, to a penalty of £100. Section 24 of the same Act provides also that if any person carries, or attempts to carry, dangerous substances, under a false description, he will be liable, for every such offence, to a penalty of £500. These proceedings were taken against the prisoner only under the 23rd section. Mr. Poland then said that the prisoner took his passage from Venice to Bombay, and when doing so, asked if he might take some photographic chemicals with his luggage. He was shown the rules of the company, which utterly forbade the carriage of explosive or dangerous materials on board their ships.* He then left, but soon afterwards two packages, marked "H. W. J." were sent by him to a branch office, at Cockspur Street, as passenger's luggage, and were forwarded to the Nine Elms Station, on the way to Southampton. There an accident happened to one ot the packages, and it was discovered that they contained photographic chemicals, such as collodion, ether, &c., all highly inflammable. Ether, for instance, threw out a vapour when exposed to even moderate heat, and the vessel these goods were to be placed in was to pass through the Red Sea. If these boxes had been put on board, in the hold, the result might have been a fearful calamity. The company had taken these proceedings with a regard to the public safety.

Mr. Poland then called Sergeant Pittman, 44 E, and James Smart, 111 E, who gave evidence as to the circumstances attending the defendant's arrest.

Thomas Coyle (clerk of the Peninsular and Oriental Company, at 122, Leadenhall Street, City) deposed that on April 6 the prisoner took a second-class ticket from Venice to Bombay in a steamer that was to leave on April 21. He said he wanted to send a camera and a few bottles of non-explosive photographic chemicals as part of his baggage. Witness said they could not be taken as part of the baggage, and also that they would be explosive if there was collodion or stuff of that kind amongst them. There is a notice in the office to the effect that passengers' baggage can be received at Cockspur Street, the branch office of the company. The prisoner had travelled before.

Henry John Waller (messenger in the service of the company at Cockspur Street) said it was part of his duty to receive passengers' baggage. On April 10 he received two cases, those now outside. They were marked "H. W. J., passenger, *Bokhara*." They were forwarded to the railway to be sent to join the vessel at Southampton. On the 13th witness went to the Nine Elms Station, and there again saw these two packages. One of them had been partially burnt. He saw six bottles with labels on them—ether, collodion, &c.

Cross-examined: The defendant did not deliver the bottles to witness.

James Powell (receiver of goods at the Nine Elms Station) stated that on the morning of the 12th he saw a van of goods belonging to the P. and O. Company on their premises. He proceeded to open it. This was about a quarter to two in the morning, and he was doing it by gas light. He took off one case and put it on one side to get the second case. He noticed a very bad smell, but as there were several packages about he could not at first tell where the smell came from. In about three or four minutes smoke came from the case he had just put on the platform, and witness had it at once removed. Some explosions occurred inside the case. The foreman came and had both cases removed to the engine-house.

One of the packages was here brought into court.

Mr. Lewis objected to its being close to him.

Mr. Poland observed that it might be brought close to himself, and he would sit on it if Mr. Lewis liked. It was not dangerous now. It was only dangerous in the hold of a vessel.

Dr. Albert James Bernays (professor of chemistry at St. Thomas's Hospital) said he had examined the case produced. It was lined with tinned iron. In one corner of it some damage by fire had been done. There was a great smell of nitrous-ether. The iron was perforated, and pieces could be broken off quite easily. Witness imagined that would be caused by a mixture of acid and iodine. The hay in which the bottles had been packed was very much charred. There were several broken bottles inside, one of acid. The action of acid upon tinned iron produced heat quite sufficient to cause the present accident. The things in the box were of a highly inflammable and dangerous nature. Collodion, for instance, one of the things in the box, is made by dissolving gun-cotton in a mixture of alcohol and ether. With proper care these things might have been conveyed to Bombay with perfect safety, but not if they were treated as ordinary luggage.

This concluded the case for the prosecution, and after Mr. Lewis had addressed Mr. Flowers in mitigation of the penalty, the magistrate decided that the charge was clearly proved against the prisoner. Taking into consideration, however, that he had been put to inconvenience and loss of time by being arrested, thus delaying his journey, he (Mr. Flowers) should reduce the penalty (£100) to one of £70, and £10 costs, making in all £80. If the defendant would find two sureties in £50 each, and enter into his own recognizances in £100 to appear next Saturday, or to pay the money in the meanwhile, he might have that time allowed him.

Bail was forthcoming, and it was promised that the money should be paid.

We have received the following letter from Mr. Tench, who supplied the chemicals in question :—

"Sir,—In the report in the daily press of the above case the facts are not clearly represented, and I shall be obliged if you will allow me, in justice to Mr. Johnson, to say that he ordered his agents to ship the goods, and of course was under the impression that that would be done in the ordinary course; but as my clerk omitted to send the invoice with the goods, and Mr. Johnson had sent other personal luggage, they (the agents), thinking the case was personal luggage too, sent the chemicals to the P. and O. Co. as luggage, and thus caused Mr. Johnson the great annoyance and loss already reported. The rain partially obliterated the mark that was put on the case. By inserting this letter you will greatly oblige your obedient servant, M. P. Tench.

153, *Fleet Street, London, E.C.*

Recent Patents.

IMPROVEMENTS IN PHOTO-COLLOGRAPHIC PRINTING.

BY A. P. DESPAQUIS.

[In the following specification M. Despaquis describes certain improvements in the mode of preparing the collographic surface for printing, and some improvements in the printing appliances.]

This invention of improvements in the preparation of gelatine and albumen photographic plates for printing from with lithographic inks is based upon the following observation:—That a layer of bichromated gelatine intended to furnish a plate for impressions with lithographic inks, however thin it is, may be divided into three parts or thicknesses.

In operating after the Poitevin process (process called Albert-type) the sensitive layer is thus composed:—Firstly, of a layer of albumen and bichromate run over the surface of the glass; secondly, of a layer of gelatine (also bichromated) covering the albumen, and together forming the total layer to be converted into the plate for the impressions. This total layer may then be divided into three thicknesses: the first attached to the glass, and composed of albumen; the second forming the exterior layer of gelatine; and the third forming the intermediate part between the layer of albumen and the exterior part of the layer of gelatine Up to the present time all those who have employed this process, or the analogous processes of Edwards or others, have proceeded as follows:—The layer of albumen, being placed on the glass, is rendered partly insoluble either by the cooking or drying at a temperature of 60° to 80° Centigrade. It is then rendered totally insoluble and adherent to the glass by solarization through the glass. This result arrived at, the layer is then covered over with another layer of bichromated gelatine. This second layer being dried, the glass plate thus prepared is placed in the pressure-frame under the negative to be printed, the gelatine side in contact with the negative, and exposed to the light. After exposure the plate is immersed in cold water to free it from the bichromate not acted upon, or otherwise to fix it. In this manner two only of the three layers of the total have been rendered insoluble by the light, the one forming the support and adherent to the glass, and insoluble beforehand, the other forming the exterior of the gelatine, and solarized under the negative; but this solarization under the negative of the exterior of the layer of gelatine has penetrated unequally, according to the transparencies of the negative, and has not traversed entirely the intermediate thickness, which consequently remains hygrometric, and will absorb the water like the exterior parts of the layers which have been preserved from solarization by the opacities of the negative, and should take the water which repels the fatty inks, so that after a very limited number of proofs the intermediate layer is found saturated with water, it loses its adherence to the layer of albumen forming its support, and is dragged off by the inking roller, and the plate is destroyed.

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* This, Mr. Johnson, states is not the fact. He was simply told that the nature of the goods would have to be declared. See a leader on this case.

The printer, to avoid the rapid destruction of the plate, dares not sufficiently water it before the passage of the inking roller, and the ink not being sufficiently repelled in the whites and half-tints the proof loses its contrasts. To obviate these inconveniences, after the two exposures above-named are made a third exposure must be made through the glass to let the light penetrate, and consequently render it insoluble and make it lose its hygrometric condition in its intermediate thickness until it meets with the solarization which has had its action under the negative up to the strong half-light, so as to stop the water passing behind the blacks and half-tints (the gelatine will take sufficient water between the tones of the image), so that the two solarizations form the two links of a chain, and do not come away from the glass without great difficulty, allowing a much greater number of proofs to be taken off. This solidity of the layer allows the plate to be wetted; much more, the proof does not lose its contrasts, and the whites remain pure. The application of this action may be made in other ways:—

Firstly. In suppressing the preliminary exposure of the layer of albumen, or, if necessary, suppressing it altogether, and commencing to solarize the exterior layer under the negative, and then solarizing by the ordinary light from the back of the glass until the action of the light meets the blacks and deep half-tints of the first solarization. It will be seen quite easily when the two solarizations meet each other, and consequently the moment to stop the exposure to light when the proof commences to fade away and to become of one tint.

Secondly. If the layer of albumen has been first of all rendered insoluble either by cooking or solarization through the glass, by recovering this first thickness by a second in bichromated gelatine, but very thin, and calculated so that the solarization through the negative allows the light to penetrate to give the blacks and the deep half-tints up to the layer of albumen, so as to render them adherent, in place of employing the ordinary means of damping with a sponge (a method which necessitates the use of a dry dabber to remove the excess of water, and, above all, that left in the depressions forming the blacks of the image, and which should take the ink), I employ, as part of my invention, a roller in porous stone or Passy brick, which is rendered specially porous and spongy. With this damping roller the damping is only done in the reliefs of the plate, that is to say, in the parts not solarized, and which ought to take the water and repel the fatty ink, and consequently form the lights of the picture. In this way, the water not running over the entire plate, but depositing itself solely on the parts in relief, and which are the only parts requiring it, it becomes unnecessary to use the dry rubber, and there is no fear of taking away the water from the parts which should be saturated, which causes the ink to adhere to these parts and equalizes the half-tints with the blacks, and stains the white. My invention rests, then, on the observation that, to obtain a photographic plate upon gelatine for printing with lithographic inks (process Poitevin, Albert, or analogous one) fit to give a great number of proofs, and to prevent the half-tones equalizing themselves with the blacks and the whites from staining the general solarization through the supporting layer (or even when there is no supporting layer, as in the process Edwards, or gelatinized metallic gauze) ought to be carried on until it meets with the blacks and deep half-tones of the exterior solarization under the negative, so as to avoid leaving between the two solarizations in the total layers an intermediate thickness, which, remaining hygrometric by the want of solarization, quickly imbibes water after the drawing off of a very few proofs, and leads to the tearing up of the plate.

I also proceed as follows:—A layer of bichromated gelatine having been exposed under a negative, is wetted on the face—that is to say, upon the image—by any means, either by immersion in cold water for some minutes if the layer of gelatine is supported by an impermeable plate, either of glass, metal, or wood, or with a sponge, if the support of the layer is permeable, such as gauze or paper, &c., so as to lift up at the surface only of the layer the bichromate which is in the shades of the image. Then the bichromate being lifted up in that part of the layer, the plate is inked, so as the better to see if the bichromate is enough lifted up; it should be just to the depth of the penetration of the blacks. This being done, all the plate is left to be acted on in mixing the water of the surface with a little glycerine, which, maintaining a certain humidity on that surface, prevents the gelatine from becoming insoluble in that part, whilst all the part in the bottom becomes completely insoluble, and gives consequently a plate fit to yield a great number of proofs. I also add that for preparing the gelatinized cloth for use as a printing plate with fatty inks, the cloth must be of flax or hemp, but not cotton or wool, from which the gelatine comes away too easily, whilst it remains perfectly adherent to the flax or hemp cloth.

To prevent the threads of the cloth from swelling and causing inequalities of surface in the layer when at the time of inking the pellicle of gelatine, the threads are enveloped with bichromated albumen by pouring a thick layer on the cloth whilst still adherent to the glass upon which the gelatine, which it recovers, has been run. The albumen bichromated and acted on by light, being completely impermeable, does not allow the water to enter the cloth, which does not swell up and leave a plane as if the support had been a plate of glass. It is well understood that the gelatine run on the glass should be well congealed before recovering it with the wet cloth, upon which shall follow the albumen coats, so that the albumen well envelopes the threads of the cloth. For the taking off the proofs I prefer a cylinder press, either in wood or metal, arranged as herein-after described.

A series of diagrams and descriptions of the press follow.

Having now described and particularly set forth the nature of the said invention, and the manner of carrying the same into effect, I would have it understood that what I claim is,—

First. The method above described having for effect that the two solarizations—one on the back and the other on the face—penetrate just into the parts of the film which ought to furnish the blacks and deep half-tones, or better, in the case of an insoluble support, that the solarization of the blacks and the deep half-tones have penetrated up to the support, so as to render them adherent to it.

Secondly. The spongy and hard roller above described serving to distribute the water only on the parts of the plate in relief which have need to receive it to prevent the destruction or rapid equalization of the plates, which also abbreviates considerably the work of printing, and above all allows, conjointly with the improvements described in claim 1, the employment of the presses with mechanical action.

Thirdly. The use of the cloth and the sheets of zinc, which allows the employment of the press.

A MODIFIED BURNISHER.

BY WILLIAM CLEARY.

The following specification describes a modification in the construction of a burnisher for photographs. The invention received provisional protection only.

My invention relates to that class of press for such purposes wherein the photograph, card, or other article, is glazed or polished by passing between a revolving roller and a fixed burnishing bar; and my invention consists principally in giving to such burnishing bar a reciprocating or to-and-fro motion in the direction of the axis of the roller whilst the latter revolves, whereby a much better burnishing effect is produced than can be obtained by the machines hitherto used, wherein the burnishing bar is stationary and the roller revolves. I mount in suitable bearings a cylindrical roller, the surface of which is by preference "draw filed" in the direction of its length in order to cause it to take a firm hold of the back of the photograph or card. Beneath this roller I mount a burnishing bar fitting accurately to the under side of cylindrical roller throughout its length, and having its surface highly polished. This bar is fitted into slides, so that it cannot move in the direction of the rotation of the roller, but can move to and fro in a longitudinal direction—that is, parallel to the axis thereof. The roller is turned by means of a winch handle, and attached to it or to the axis is a cam or other equivalent device, which, as the roller revolves, imparts a to-and-fro motion to the bar, and it will hence be evident that if a photograph, card, or other similar article is passed face downwards between the roller and the bar (the handle being turned), the roller will draw the article through, whilst the burnishing bar, moving to and fro across its under surface, will impart the desired glaze or polish thereto. The steps in which the axis of the roller revolves are provided with screws for giving the required pressure, and the machine is kept heated whilst in operation by means of a gas or other lamp as usual in such machines.

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PHOTOGRAPHIC CHEMICALS AS "DANGEROUS MATERIALS."

A case of considerable interest to photographers was heard at Bow Street on Saturday last. The offence charged was an attempt to transmit photographic chemicals, in defiance of an Act of Parliament, as ordinary passengers' luggage, and the issue was the imposition of a penalty amounting to eighty pounds sterling. The facts as reported in our daily contemporaries scarcely convey an accurate version of the case, as it has since been presented to us, and they seem to suggest a degree of blame as attaching to Mr. Johnson which is not justified by the circumstances. The actual facts appear to be as follow:—

Mr. Henry William Johnson, described as a merchant, and, presumably, an amateur photographer, was about to visit Bombay, and had taken passage in one of the vessels of the P. and O. Company, intending to join it in the Mediterranean. His luggage, however, would go on board the vessel, which was the *Bokhara*, at Southampton. Before despatching his luggage, he inquired at the office of the company if he might take as luggage a camera and a few bottles of photographic chemicals, intimating that they would be of a non-explosive character. He was told, he informs us, that collodion and similar substances would be classed as dangerous, and would require to be declared as such. His agent subsequently sent the cases to a branch office of the company for transmission to Southampton. For the purpose of transmission to this port they were conveyed to Nine Elms Station, and, when removed from the van for transfer to the rail, some "accident" is said to have happened. Its nature is not precisely stated in the reports of the daily press, a compilation from which appears on another page. It is stated that smoke was seen issuing from one of the cases, and explosions taking place inside were heard, some portion of the contents, according to subsequent evidence, having been on fire. The exact contents of the case, and the precise cause of the fire and explosions, are not stated. Dr. Bernays, who gave evidence of the dangerous character of the contents of the case, speaks of several of the bottles being broken, one of them acid; this acid—presumably nitric acid—acting upon the tin surface of the tinned iron lining the case, would generate heat. At any rate, it appears, there was a heterogeneous collection of dangerous substances not packed with sufficient care and security to withstand the rough usage to which such packages are submitted in the the hands of carriers; and the bottles breaking, their contents mingled, and produced the results described. Since the hearing of the case, we have had an opportunity of inspecting the case in question, and the results suggest that fear of an indefinite evil has induced exaggeration of the facts. A bottle of nitric acid had broken, and coming into contact with the tinned lining had undoubtedly generated heat, but not enough to cause fire, of which we saw no trace. The heat had, however, caused the cork or stopper to fly out of a bottle of collodion, and thus produced the sound described as explosion. The tray used in packing. and wood of the box, were also charred by the acid, but not by fire. The facts, although somewhat exaggerated, as it seems to us, were, however, sufficient to justify the steps of the P. and O. Company. If the accident had occurred in the hold of a passenger ship when out at sea, the fire might have spread unseen until it was beyond control, and an appalling calamity have ensued. The legislature has specifically provided against such mischances by making it a penal act to place any dangerous article on board a ship without fully declaring its nature, so that proper precautions may be taken. The fine imposed for violation of the Act is a somewhat heavy one, and may amount to one hundred pounds for each offence. In the case under notice, Mr. Flowers, the magistrate, mitigated the fine to seventy pounds and the costs, amounting to ten pounds more—a heavy penalty for an act of thoughtlessness or ignorance, rather than a deliberate crime, but unquestionably not in excess of the offence, when viewed in relation to its possibilities for evil! It is only due to Mr. Johnson to state at this point that the forwarding of the csaes in the manner described was the act of his agent, not of himself. The chemicals were supplied by Mr. Tench, who forwarded the cases, as instructed, to Mr. Johnson's agent. They were duly described outside as photographic chemicals. From some oversight of the agent, not explained, he neglected to declare the contents in the usual way, and sent them in as passenger's luggage. In such a case it seems the old legal maxim obtains: *qui facit per alium, facit per se*; and Mr. Johnson, although personally innocent, stood in the dock charged with a serious offence, for which he had to pay the penalty.

The case suggests several cautions. Many photographers are in the habit of taking short trips by sea, to Ireland, the Channel Islands, and various parts of the Continent, and of taking with them small equipments of photographic materials, as personal luggage, never dreaming that they are violating an Act of Parliament, and incurring a penalty of one hundred pounds, or even that sum several times repeated. The number of photographic travellers by sea, it is true, may be somewhat limited, but a similar risk is incurred in relation to every package which may be declared dangerous, which is transmitted by rail. The sender of all such goods is enjoined to mark the nature of the contents distinctly on the outside of the package, and failing this he is liable to a penalty, not of one hundred pounds, it is true, but to a fine of twenty pounds for each offence, and he is further held liable for the amount of any damage to other goods which may arise from accident to such packages. Photographers carrying photographic chemicals with them on journeys, and dealers in such goods, probably frequently overlook the existence of this law, and the recent case at Bow Street may serve as a wholesome reminder.

It is scarcely worth while to draw attention to the importance of careful packing in relation to photographic chemicals. Looking at the treatment which goods receive whilst in the hands of carriers, it is on the whole surprising that so few accidents occur. The mode in which luggage is jerked and pitched about in transference to the hold of a vessel seems frequently sufficient to dash to pieces anything less brittle than a solid block of lead. In Mr. Johnson's case, it appears, a double error occurred. The bottles were not packed sufficiently secure to protect them from breakage, when subject to the risks of their journey; and in one case chemicals which become especially dangerous when in proximity were packed together. The breakage of bottles of ether, collodion, or alcohol, might not have been dangerous in a box with air-tight lining of tinned iron. But these, or these and possibly pyroxyline, in one case with a bottle of nitric acid, which, if broken, at once generates heat when brought into contact with tin, was surely an imprudent combination.

In the photographer's operating room generally more dangers are lurking, ready to be let loose by acts of carelessness, than are often contemplated. Familiarity with danger breeds contempt for it; but in many cases it is not familiarity, but ignorance of its existence, which results in indifference. How few operators who are continually using collodion in the dark room remember how easily ether is vapourized, and how dangerously inflammable is its vapour! How few remember that if a bottle of collodion or ether be broken or spilt in the dark room, it is the most dangerous thing in the world to stoop with a light to pick up the fragments of glass which are strewed about, because the heavy vapour of ether crawls along the ground and ignites when a light is brought down near it. There is no necessary danger in the practice of photography, but it abounds with dangerous possibilities for ignorance and carelessness.

THE FADING OF SILVER PRINTS.

We do not feel that any apology is needed for keeping this subject steadily before the attention of our readers, and giving full weight to every additional piece of evidence or argument which can affect the question *pro* or *con*. If the causes of fading can be definitely decided, and a remedy found, it is fully time that both these things should be done. If not, the inevitable carbon supplanter will only take its place with quicker steps. In our present number an experienced albumenizer distinctly admits, his statement being based on specific experiment, that prints produced on paper prepared with stinking albumen will fade. Referring the original use of stale albumen to German houses, he admits that some English manufacturers have been driven to a similar practice by the "state of the market." We fear that the argument, although a very natural one, is unsound; but it is not our purpose here to apportion the blame of the pernicious practice. It has brought its Nemesis alike to photographer and manufacturer. The important point now is to secure a definite recognition of the fact that decomposed albumen is a serious source of instability, and to induce all, albumenizer and photographer alike, to combine against its use, and so eliminate one serious source of instability from silver printing. Mr. Bovey encloses us a print in proof of the possibility of securing permanent prints, the example in question having been exposed for months to various destructive agencies without change, no difference being perceptible between a covered and exposed portion of the print. This is a point upon which, however, no question exists. Almost every photographer is doubtless in possession of prints produced a dozen or twenty years ago, which are now in perfectly good condition. We have prints of our own, and of many leading photographers—Dr. Diamond, Mr. Robinson, Mr. Mayland, Mr. Blanchard, Mons. Adam-Salomon—produced at various times, varying from a dozen to a score of years, framed and in portfolios, many of them in rooms where much gas is burnt, without any trace of fading whatever. They are for the most part large and important pictures, which have received individual care in fixing and washing, not being subjected to the wholesale treatment to which Mr. Ayres recently, so truly in our view, attributed so much of the fading of late years.

Mr. Bovey mentions another possible source of recent fading, and one which has been held by close observers for many years. If we remember aright, it was first brought under our attention about fourteen years ago by Messrs. Ghemar Frères. It is to the effect that the thin negatives, and consequent light prints, which began to prevail about that time were not conducive to permanency, dense negatives, admitting of a full exposure and thorough reduction of the silver on the paper, being more conducive to permanency of the deposited image than the slight reduction sufficient to produce a good print from a thin negative. We think it is probable there is some truth in this view, but it requires demonstration.

A correspondent in the present number mentions his experience in relation to the protective value of varnishing prints. There is no doubt that varnish will protect a print to a considerable extent from outward destructive agencies, but it would be of little avail against the seeds of destruction originated in the print whilst it was in the fixing bath. Our correspondent thinks the fact that his varnished prints have not faded is opposed to the notion that slightly toned prints fade earliest. It really does not touch that point. Theoretically, it would unquestionably appear that the more thoroughly the silver image is converted into an image of a more stable metal, gold, the more stable the print is likely to be. And this theoretical argument is borne out considerably by facts. In any case varnishing prints could scarcely be generally adopted, as it is a troublesome process, not conducing to the artistic quality of the picture. The treatment of the print, front and back, with collodion, introduced by Mr. Blanchard some years ago, was doubtless beneficial; but involved an amount of trouble little likely, we fear, ever to be generally adopted.

BENGAL PHOTOGRAPHIC EXHIBITION.

The exhibitions of the Bengal Photographic Society continue to maintain their interest, and that just closed has, we understand, in all respects equalled a long series of successful predecessors. English exhibitors, as usual, bear away the lion's share of the medals. Mr. Marshall Wane, it will be seen, has received on this occasion two gold medals. We subjoin the report of the judges, as follows :—

"Report of the Judges.

"*The Secretary, Bengal Photographic Society.*

"Sir,—We have the honour to communicate, for information of the Society, the awards of prizes made by us for photographs exhibited at your Society's exhibition of 1876.

"Prize A.—Gold medal by H.E. the Viceroy, to Mr. Marshall Wane, for portrait of a lady, No. 16.

"Prize B.—Gold Medal, by Hon. Lieut.-Governor of Bengal, to Mr. G. L. Kemp, for his series of pictures, selecting Nos. 142, 143, 145, 146, 153, and 157.

"Prize C.—Gold Medal, to Messrs. Bourne and Shepherd, for their series of landscapes, selecting Nos. 176, 177, 178, 179a, 179b, and 181a.

"Prize D.—Silver Medals to Messrs. Bourne and Shepherd, for their series of portraits.

"Prize E.—Silver Medal, to Captain Hugh Swiney, 17th B.C., for his series of landscapes.

"Prize F.—Bronze Medal, to Dr. Browne, Muniepore, for his series of views in Muniepore and the Angama Naga Hills.

"Prize G.—Silver Medal, to Messrs. Westfield and Co., Calcutta, for their series of portraits of natives.

"Prize H.—Silver Medal. There was no series of photographic pictures of Indian antiquities to which to award this prize. The judges recommend, therefore, that this prize be awarded to Mr. J. Solomon, of Dessau, for his beautiful series of portraits.

"Prize I.—Gold Medal, by the President of the Society, to Mr. Marshall Wane, of Douglas, Isle of Man, for his series of portraits.

"Prize J.—Silver Medal, by the President, to Messrs. R. Faulkner and Co., for their series of portraits of children.

"Prize K.—Silver Medal, by Captain Waterhouse, to Mr. J. Brier, of Hollington, for his series of landscapes.

"Prize L.—Silver Medal, by F. H. Bennertz, Esq., to

Mr. A. C. Caddy, of Hill Tipperah, for his series of carbon prints.

"Prize M.—Silver Medal, by the Hon. Sec., to the Royal Engineers, Chatham, for their series of landscapes.

"No reproductions of works of art were on exhibition.

"*Bengal Photographic Society*,

"*Calcutta*, 16*th February*, 1876."

Supplementary Report.

"*Calcutta*, 4*th March*, 1876.

"In accordance with the desire of the committee of your Society, we re-assembled this day at the exhibition room, and, after seeing the pictures recently arrived from Europe, &c., have now the pleasure to submit the following recommendations for consideration and approval:—

"We would give an extra silver medal to each of the following exhibitors:—To Herr C. H. Jacobi, of Coblenz, for his series of pictures of reproduction of works of art, and his excellent mechanical prints, selecting Nos. 2, 4, 5, 7, 8, 9. To Messrs. Reichard and Lindner, of Berlin, for their very superior series of portraits, selecting Nos. 1, 2, 3, 6, 7, 8. To Herr Robert Scholz, of Gorlitz, for his series of landscapes, which are specially deserving, selecting Nos. 1, 3, 4, 6, 8, 10.

"Mr. Isaac having offered a silver medal for the best composition picture in the room, we have no hesitation in awarding the prize to Mr. Smith, for his picture of 'Girls at the Spring.'

"We desire, also, to draw attention to the beautiful views in California, which are not, however, for competition.—We have the honour to be, Sir, your most obedient servants,

"J. E. Gastrell, Col.
"T. S. Isaac.
"V. Pout."

FRENCH CORRESPONDENCE.

Carbon Printing in France—M. Liebert's Improvements—A New Manual—How to Produce Portrait Cliches with Various Backgrounds—Printing upon a Hygrometric Film.

It is well known that among French photographers M. Liebert was one of the first to adopt printing in permanent pigments. Having become the associate of M. Lambert, who practised the process, on his part, with a great degree of skill, and having also made use of the latter's method of enlarging, M. Liebert was tempted to push as far as possible his efforts in this direction, so that he might be in a position to instruct any of his colleagues wishing to become licencees in the process of Lambertype. It may be said, therefore, that the director of the *Photographie Americaine*, as M. Liebert is called, is one of the most competent and practised teachers of this style of printing. Having appreciated, more than any one, the advantages of pigment printing, he has been able to vulgarise it successfully among his colleagues; and he has, moreover, written a complete manual of the new methods of printing, under the title of "Carbon Photography Placed Within Reach of All." This work has only just appeared, and we may at once state that it fulfils its object most completely. The book is divided into three parts: the first contains a description of all the manipulations, down to the smallest details; the second is devoted to the process of enlarging by means of carbon transparencies; the third part describes at length a new method for substituting backgrounds of a varied character, according to wish, for those which are in the original cliché, in such a way that the portrait and background are printed simultaneously.

If we tried to give a resumé of the work for the benefit of the readers of the Photographic News, we should not probably bring before them any novelties, for it is the collective nature of the information given that constitutes the especial value of the work under consideration. The preparation of the tissue, sensitizing it, the development of the image, the transfer from the provisional to the definite support—all these are described with much accuracy and clearness, and form together a valuable handbook. For this reason, having an eye to the limited space at our disposal, we think it preferable to give a succinct description of the very original process which M. Liebert employs for varying the backgrounds of his portraits. Having chosen a view of an interior, or of a landscape, which is to replace the original background, a print is produced in carbon or silver, and the outline is cut out and attached to vegetable paper. This is applied to the plate of ground glass which serves for the focussing screen of the camera, so as to determine the place and the dimensions of a portrait or group, the outline being reversed so as to be in the same position as the object appears. You proceed with the execution of the portrait as usual, and after it has been obtained it is retouched and varnished, care being taken not to touch it with the fingers, so that later on no spots or stains may be produced. The model should be placed in front of a background more or less dark in tint, according to the effect of perspective that it is desired to give, or, better still, it is put before a graduated ground, greyish black above, and of a deep black below. The carpet below must likewise be perfectly black. The result is, that upon the finished cliché the model is represented surrounded by transparent glass as if it had been taken in space. The negative is varnished, and the plate covered with the undermentioned solution:—

Filtered water	100 cub. cents.
Albumen	100 ,,
Glycerine	5 ,,

The negative is gradually dried, and the albumen coagulated either by means of a nitrate of silver bath made up with water or alcohol, or simply by dipping in alcohol, or exposure to steam.

After drying, the negative is treated with a mixture composed of:

Filtered water	100 cub. cents.
Sugar candy	2 grammes
Honey	1 to 2 grammes
(According to the temperature).	
Dextrine	4 grammes
Gum arabic	4 ,,
Phenol	2 ,,
Glycerine	50 centigrammes
Bichromate of potash	2 grammes

The negative when dry is exposed under the background negative, having care that the two surfaces are not in actual contact. It is impossible to watch the progress of the printing, as a latent image only is produced, and for this reason recourse must be had to a photometer. The exposure varies from one to three minutes in the sun, and from five to ten minutes in the shade, according to the intensity of the background negative. When the exposure has been deemed sufficient, the plate is taken into the dark room, and put upon a stand or retouching desk, before a window of yellow glass. Over the surface, with the exception of where the model is, is passed a brush full of fine graphite powder. The image of the background appears by degrees; when it is found to be sufficiently vigorous, the image is fixed by covering with a layer of collodion made up of—

Sulphuric ether	100 cub. cents.
Alcohol at 40°	100 ,,
Normal collodion containing one per cent. of pyroxyline ...	10 ,,

When this film is dry, the plate is immersed in water for a few minutes; afterwards it is varnished again, and then the cliché is ready for printing.

The question of pose is very important, for if it has been too long, the powder adheres badly and imperfectly; if, on the other hand, the exposure has been too short, then the powder cakes all over the surface. The proportion of honey in the formula which we have indicated should be increased with the dryness of the weather at the time being.

The great advantage of this mode of working is, that in case of non-success, you may recommence without injury to the cliché upon which you are working, but, in this case, it is necessary to plunge the plate in a bath of warm water slightly soured by means of hydrochloric acid, to remove the film with which it is covered. As soon as the gum is sufficiently soft, you rub gently with a bit of soft, fine rag until the whole of the gummy mass has been removed, and then you wash with cold water. After drying, the cliché is varnished once more, and, having in this way been brought back to its primitive condition, the treatment above indicated is once more begun. Instead of applying the sensitive solution direct to the negative, it may be applied to a sheet of vegetable paper which has first of all been gummed, wetted, and sponged between two sheets of filter paper. It is pressed and heated upon a stove; before the plate is completely cool, the sheet of vegetable paper is put over it, and varnish applied. Upon this surface the hygrometric film is applied, and then the other operations are proceeded with as I have just described. By working in this manner, the reader easily understands that, if the result is not satisfactory, it is simply necessary to plunge the cliché in warm water containing hydrochloric acid, where it is left until the paper becomes detached, leaving the plate as intact as it was before.

The greater part of the portraits produced now-a-days at M. Liebert's establishment in Paris are obtained in this manner, and his customers bear testimony to the artistic effect of the pictures in question.

Ernest Lacan.

◆

ON PHOTOGRAPHING THE RED AND YELLOW RAYS OF THE SPECTRUM.

BY PROFESSOR H. VOGEL.

Captain Abney published in the *Photographic Journal* a communication that has reference to my investigation upon the sensitiveness to light of bromide of silver in the presence of mixed colouring matters. Captain Abney has, he tells us, discovered a resin (which he does not, however, name, and whose qualities, therefore, cannot be discussed), the addition of which to bromide of silver collodion renders the latter sensitive to the red end of the spectrum. He mentions very particularly that with an exposure ten times as long as that necessary for the impression of the blue rays, he has photographed the spectrum as far as line B, and with an interval of twelve and a-half times he has obtained the spectrum beyond line A.

Upon this I may remark that I have secured a similar result with pure bromide of silver (bromised collodion prepared in a pure silver bath, and washed). I have in this way secured a photograph of the ultra-red of the spectrum without giving a longer exposure than Captain Abney. From this it may be inferred that the resin can only increase the sensitiveness of bromide of silver for the less refrangible rays of the spectrum but in a slight degree.

On the other hand, according to my experiments, the addition of certain colours augments the sensitiveness to light of bromide and chloride of silver for yellow and red in such a degree that I am in a position to secure a representation of the yellow and orange at the same time as the blue. Nay, more; chloride of silver coloured with naphthaline red is *more sensitive* for the yellow of the spectrum than it is for the blue, and the same is the case, according to Waterhouse, with eosin-bromide of silver.

This extraordinary increase in the sensitiveness of bromide of silver for yellow and red by the addition of colours can, for this reason, scarcely be accounted for by the slight increase of sensitiveness observed by Captain Abney for the less refrangible rays. It is rather rash, therefore, to ascribe the increased sensitiveness of my coloured plates to the formation of organic silver salts. Nobody has heard till now of combinations of bromide of silver with resin, and Abney's experiments give us no description of them.

When, however, the increase of sensitiveness for the less refrangible portions of the spectrum is to be seen just at the same spot where the absorption line of the added colour lies; or, as in the case of chlorophyll, which has several absorption lines, there is stronger photographic action exhibited at several places; and when, further, it is found, as I have recently noted, that bodies added which annul the absorption of eosin (a little acid, for instance) have the effect of annulling this increased sensitiveness of bromide also, then, I say, it must commend itself to every attentive mind that there is connection between chemical action and absorption.

My explanation of the action of colours upon bromide of silver is based upon this connection. The same theory has been broached by other philosophers before it was advanced by myself—to wit, Herschel, Draper, Schultz-Sellac—while by German physicists it is regarded as an established principle, to which my work has given greater security and breadth.

Captain Abney does not think that he is openly combating this principle when he says: "To me it seems natural that they (the organic silver compounds) should be most sensitive to those rays which they can transmit."*

It is to be regretted that nearly all who have repeated my investigations have contented themselves with photographic experiments, without at the same time undertaking an accurate and complete study of the absorption phenomena, or making themselves acquainted with what has long been published regarding such phenomena and their connection with chemistry. I must, however, except Captain Waterhouse, who has studied with much care the absorption conditions of eosin, and published some remarks upon the same in the proceedings of the Asiatic Society of Bengal.

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FADING OF SILVER PRINTS.

BY W. T. BOVEY.

As it was in the beginning, is now, and (as long as photography continues) it will be, customary to trace home all printers' ills to something that is attached to the paper. Do whatever they may with a view to earn favour, albumenizers, like "the old man and his ass," when they flatter themselves that, at length, they do right, they unsuspectingly are stepping on the threshold of wrong. Years ago, when "eggs were eggs" as regards price, and albumen was a pattern of sweetness, complaints innumerable prevailed. "No surface" (occasionally); "bad tones" (perpetually); "measles" (demonstratively); "help" (this so pathetically that fancy could hear the very ink moan). Time, however, wrought experience, and experience found remedies; hence, results being better kept under control, complaints gradually lessened, and for a brief season albumenizers were granted some rest from recapitulations of hardships inflicted on mankind by "that horrible paper." Unhappily, however, albumenizers had scarcely settled themselves down to enjoy a mental *siesta* when an epidemic set in which, having no appropriate name, I might describe as a Germanic photographomania: posing, lighting, dodging, retouching, every studio in this country was duly transformed, and Mynheer Van Dunk caused a deal of confusion. For some little time the cherubs who sensitize in coal cellars, and print on the roofs, escaped an attack of this dreadful Germanic photographomania. At length, however, the evil day came when printers and their satellites were seen to make grimaces before a highly-glazed paper, whose surface was lustrous, whose smell was a sulphuretted hydrogen perfume. On inquiry it was ascertained that the German paper was supplied at a cost that no English albumenizer could follow and be honest, and with reference to brightness of surface and richness of prints, English makers were outside the mark altogether. Perhaps the most clinching argument that went in the favour of German albumenized paper was presented by Captain Abney, who provided it without duly reflecting on the chemical principles involved. In reply to the gallant gentleman just named, I penned a few remarks, with a view of stemming a new tide of folly; and I essayed to show what might be naturally expected from a use of decomposed albumen. "Labour in vain;" perhaps it were thought that "*shop*" was my chiefest object. If so, I am at length amply revenged, inasmuch as it is now fully known that fading is induced by stale albumen.

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* Photographic News, March 31st, p. 148.

Several months ago Mr. Robinson kindly furnished me with details of his extensive experience with German paper, and, as a consequence thereof, I commenced a series of experiments in order to learn how far albumen might be decomposed without being a real photographic danger. The interesting results I obtained conclusively showed that albumen might, with perfect safety, be used as long as the scent it gives off is one of rancidity only. Immediately that stage of putrefaction is reached when sulphuretted hydrogen is evolved, every print prepared on such material is doomed in a short time to fade. Not that kind of fading which consists of a light yellow veil that mars the beauty of a print, but does not injure its actual permanency, but it is an eating-up process that begins at the middle tints, and in very quick time devours the whole of the picture. It is all very plausible to complain of English albumenizers for having dealt in such treacherous wares; but it should be remembered that English dealers took their stand on dangerous ground, not because they liked it, but on account of the "state of the market." Give your orders, gentlemen, and I am quite satisfied that English albumenizers will renew their old calls for fresh eggs. I trust, at all events, that as the folly of using sulphuretted hydrogen for printing purposes is now pretty generally condemned, the only really bad part of the Germanic photographomania will be stamped out, and English patronage will permit English dealers to do a trifle more than to live. Whilst the mania for stinking albumen continued, living was out of the question, except albumenizers chose to run with the stream, or to risk a verdict of *felo-de-se*, by eating up their own paper.

It might not, perhaps, have occurred to photographers generally, that the most stable prints, under the most favourable circumstances as regards paper, are those produced from vigorous negatives which admit of the silver being completely reduced by a prolonged exposure to light. Now the tendency of late years has been to make weak negatives the rule, for the sake of softness and general delicacy; it is more then probable that weak negatives have something to do with the matter, in some instances, when prints are seen to decay.

After years of observation and experience, I might safely assert that silver prints *can* be produced that would compete with carbon, so-called, in the matter of permanency. But in order to secure these, fresh (or at least, what would be called very moderately stale) albumen must be the rule. And in the event of such course being observed, with care taken in fixing and washing, the prints of the future will prove less fugitive then they appear of late to have been. I enclose a print which for several months has been exposed (nailed on a wall) to all weathers, changes of temperature, and humidity of air. The only shelter it was allowed was freedom from rain. A portion of the print was masked with brown paper. Perhaps, Mr. Editor, you will kindly endeavour to trace any indications of fading, or difference of colour, between the outer line and the limit that was blocked out?

Correspondence.

FADING.

Sir,—Allow me to point out that varnished glass positives do not fade. About a quarter of a century ago I did nothing else for several years, and none of these, so far as I have seen, have faded. Indeed I wish some of them had. Does this fact not upset the idea of the fading of warm-toned prints through deficiency of gold, mentioned in your last number? The chief reason, I suspect, will be found in the mess mis-called albumen.—Yours, &c.,

Silver Stained.

Sir,—I have been much interested in the corrrespondence which has recently occupied the columns of your journal on the subject of the fading of silver prints, and as I have had no little trouble in consequence of this malady, perhaps you will allow me to relate my experience.

A year or two ago I had prints returned to me frequently, with the remark that all the lot had been smitten with "smallpox." At this time I used the rotary washing arrangement. Feeling convinced that the cause of the disease lay in insufficient washing, I determined to adopt a different method. I will now describe to you my present mode of procedure, which I commenced about twelve months ago.

The prints, after being washed in four or five changes of water, are toned with chloride of gold and acetate of soda; they are then rinsed and placed in the hypo bath (one part hypo to six parts water), where they are kept in motion, and are frequently turned over one by one, to ensure perfect separation, for fifteen minutes, after which they are transferred to a dish of cold water, care being taken that they do not adhere one to another. In this dish they receive ten changes of cold water, and are stirred between each change, so that all get a fair benefit of the clean water. They are taken out of this, and placed a few at a time into a dish of warm water, from which they are taken one by one, sponged back and face, and immersed in another warm bath; they are again taken a few at a time and placed into a third supply of warm water, and subsequently receive ten changes of cold water, as before. The soda-hyposulphite bath is made fresh for each lot of prints, and usually from two to five sheets are fixed in about two quarts of the solution. Since I adopted this system I have rested quite satisfied that I had heard the last of "leprosy" and "snow storms," but—woeful to relate—a few days ago I discovered that some prints which had been done within the last few months were showing unmistakable symptoms of this dreadful complaint. I enclose one for inspection. Now, what must we do? That the prints are thoroughly fixed I cannot doubt; that they are perfectly washed, ditto. What can it be?

In the hope that this discussion may result in the discovery of some remedy for preventing this epidemic, yours,

Snowstorm.

P.S.—We are not troubled with the ordinary yellow fading. Our fading always takes the form of spots.

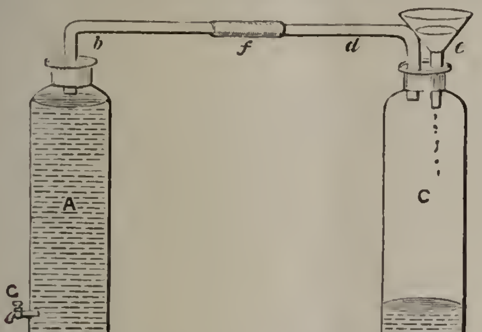
[The spots are beyond a question due to the bronze powder with which the printing at the back was covered. We saw from the print that this was the cause, although it was only on close examination we discovered any bronze powder, as it seemed to have been carefully rubbed off the lettering.—Ed.]

A FILTER FOR THE NEGATIVE BATH.—FADING IN PRINTS.

Sir,—I send sketch of a simple little piece of apparatus for filtering the negative bath. It scarcely wants explanation, but I had better, perhaps, say a few words respecting it, as one is so apt, when one knows how a thing is done, to under-estimate its difficulties.

A is a bottle fitted with a tap, having a tight-fitting cork, through which a short piece of glass tubing, B, is passed (a good varnish for making corks air-tight may be made by dissolving powdered scaling wax in warm spirits of wine).

C is a wide-mouthed bottle—perhaps a Woulfe bottle is the best (*i. e.*, a bottle with two necks); this bottle has a piece of tubing, D, exactly similar to B, fitted to it, as well as a large funnel; care must be taken to make this quite air-tight.



To start the action, fill the bottle A with water, join B and D together with a piece of india-rubber tubing, P; put the filter paper in the funnel, E, and turn the tap, G, on. As the water flows out, it causes a vacuum in C; the air only being able to enter through the filter paper, draws the bath solutions through it into the empty bottle, C. You can filter at about ten times the usual speed with this little apparatus.

Mr. Hill, in last week's News, calls attention to one cause of fading being in toning, less than was usual some time ago, in which I quite agree; but none of your correspondents seem to keep the maxim of fixing in their minds, viz., that every proof that remains too long a time in the hypo solution passes into the condition of sulphide of silver and sulphur. Hoping by this letter to stimulate the inquiry into the causes of fading in this direction,—I am, sir, yours truly,
C. H. F. Cosens.

27, *Queen's Gate, April* 15*th.*

BAINBRIDGE'S DARK TENT.

Dear Sir,—In the discussion that followed the exhibition of the above tent, at the last meeting of the Edinburgh Photographic Society, the President thought that in wet weather the tent would get soaked with water, on account of not having an outer waterproof cover, and consequently become very heavy. I beg, however, to say that such a thing does not happen, for when the tent is set up the covers are tight, and being inclined at an angle of 60 or 65 degrees, the rain runs rapidly off, so that practically it is waterproof.

As to the objection raised by Mr. Ross, I can only say that many a day have I worked in the full blaze of the sun (when no shady place was near), and no discomfort was felt, but I was rather glad I had the tent to fly to, as a place of shelter from the sun's rays; at the same time allow me to say that a fully ventilated tent can be had by any one requiring the same, without any additional cost. Nevertheless, I can fully substantiate the reply given by Dr. Nicol to Mr. Ross, that in practice no ventilation is required.—Yours truly,
J. T. Bainbridge.

A DAILY ILLUSTRATED NEWSPAPER.

Dear Sir,—In your last issue, under the heading "Photography and Illustrated Journalism," you refer to the possibility of producing in this country a daily paper illustrated by photographic engraving, and you mention at the close of the article that you do not despair of something good being done, one of these days, by the so-called photo-electric method, which has given results in its time of very fair quality.

My photo-electric process was essentially a copper-plate method, and slow in production; but, as you are aware, I have under the name of Dallastint rendered the photo-electric process applicable to the production of blocks having gradations of tint.

Speaking coolly, calmly, collectedly, and without the least desire to brag, I do not hesitate to say, that by means of this block process a daily illustrated newspaper in this country is, if the requisite funds are provided, an easy possibility. I will undertake, if a suitable negative is supplied to me at 9 a.m., that before 9 p.m. the same day a block shall be in the hands of the printer—a block capable of yielding thousands of good impressions, after being "brought up" like a fine woodcut. Not only can such a block be a transcript direct from nature, but from the most highly finished artist's monochromes in indian ink or sepia nay, even from painting in oil or water colours when these can be suitably photographed. The process exists which can do all this, and more as yet undreamt of, especially in the direction of colour.

I fear, however, there are too many vested interests in the old ruts, to give the thing a chance for a daily illustrated paper. John Bull is a slow old coach. Jonathan has too much steam. Perhaps if they were boiled together, and the product endowed with life, we might have the happy medium—judgment combined with active enterprise.—I am dear sir, yours truly,
Duncan Dallas.

362, *Gray's Inn Road, London, April* 15*th.*

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Proceedings of Societies.

South London Photographic Society.

The usual meeting of this Society was held on the 13th inst., the President, Mr. Statham, in the chair. A paper on a "New Collo-Developer" was read by Mr. William Brooks (see page 181).

The Chairman said that it was desirable that every new invention should be tested by experimentalists, and they were much indebted to Mr. Brooks for doing so with the invention in question.

In reply to a question by Mr. Fitch,

Mr. Brooks said he had used French glue in the preparation of his developer.

Mr. York observed that ten years ago he had used Mr. Lea's gelatino developer, which was introduced about that time; the present developer would, he had no doubt, be much superior to it.

Mr. Warnerke had tried the new developer, and found it to be a very valuable one. He added one drop of Mr. Lea's solution to three ounces of iron developer, and found that proportion to be quite enough, acting in a much superior manner to acetic acid.

Two negatives were exhibited by Mr. Warnerke, one of them developed by the new developer, the other by the usual developer, both plates having been prepared and exposed under similar circumstances. The negative developed by Carey Lea's new collo-developer would, he said, be found much superior to the other.

Mr. Brooks recommended the members to try the new developer in conjunction with the nitrate of baryta bath, formerly brought before the Society by Mr. Henderson. Greater rapidity would in this way be obtained, which would be useful in photographing children.

Mr. Gillo contributed a paper (which was read by Mr. York) "On the Negative Bath" (see page 183).

Mr. York then made the following remarks:—"My own experience with baryta is very different from Mr. Gillo's. I have not used such an infinitesimal dose as he recommends—never less than one grain to the ounce of bath solution, and more frequently five. I think Mr. Henderson told me that some of his baths had had over twenty grains to the ounce, and one peculiarity he finds is that the bath works more satisfactorily if filtered through iodide of silver. This seems to imply that iodide of silver is not the cause of pinholes, or that baryta entirely gets rid of the excess of iodide or bromo-ioduret formed by constant use. The one great advantage of the baryta is that it allows an old bath to be entirely used up. The fact of boiling to get rid of the spirit concentrates it to the proper strength, whereas the old method of diluting, filtering, and adding new silver still leaves an old bath. Photographers who adopt the baryta remedy will, I am sure, feel very much indebted to Mr. Henderson for his communication on the subject. It has saved me much trouble and expense."

Mr. **Wilkinson** said that in his experience a half gallon of silver solution began to fail after it had sensitized sixty to eighty square feet. After that a large quantity of crystals of a needle shape were formed.

Mr. **Warnerke** observed that the nature of these crystals would be ascertained by subjecting them to heat or percussion; the explosion that would ensue would prove them to be fulminate of silver.

Mr. **York** was also of this opinion. When fusing some of these crystals he had obtained a number of small explosions.

The thanks of the Society were then proposed to the gentlemen by whom the papers had been read, and the meeting was adjourned.

Talk in the Studio.

The Royal Society.—It will interest our readers to learn that Captain Abney is amongst the fifteen selected by the Council of the Royal Society, and recommended for election as Fellows. The election is the work of the Fellows of the Society; but it is practically a matter of form, as the fifteen recommended by the Council are invariably elected every year.

To Correspondents.

F. B. R.—If your question had been more precise and specific our answer could have been more definite. You say, "How must I enlarge?" Enlarge what? Do you wish to produce an enlarged copy from a print, or do you wish to produce an enlarged print from a negative, or do you wish to produce an enlarged negative? What is the size of your enlarging camera? It is probable, from the brief description you give of it, that one end will have grooves to hold a negative or transparency, and the other a dark slide for sensitive plates. Presuming you wish to produce an enlarged negative from a transparency, you place the latter in the groove at one end, and turn it towards the northern sky. The lens in the middle must then be focussed to the size of the image required, and the negative produced in the regular way. 2. In speaking of the table for enlarging you should state which table you refer to, and there are more than one in existence. Those in our back Year-Books are very simple. The column in the left hand gives the focus of the lens; the top line of figures the number of times of enlargements, and the figures under each head figure the distance from lens to ground glass, and from lens to transparency (or object) to be enlarged. Take, for instance, a lens of five inches focus, and a transparency to be enlarged to four times its present size, making a one-inch head into a four-inch head. Under the figure 4 at the top, and opposite the figure 5 in the left hand you will find $\frac{25}{6\frac{1}{4}}$; by which you will see that the lens in the middle is to be placed 6¼ inches from the transparency, and 25 inches from the ground glass.

Midland Photo.—We can only come to the conclusion that some reducing salt like sulphate of iron, in the form of powder or dust has come into contact with the sensitive paper.

Inquisitas.—There is no practical work on the subject of photo-lithography published. A somewhat expensive work by Col. Sir Henry James, was published many years ago by Longmans; but it was not practical enough for working purposes. Many detailed practical articles have appeared in the Photographic News, and capital brief article appeared in our Year-Book for 1867, by Mr. Butter, Photo-lithographer at the Royal Arsenal at Woolwich.

Pierre Revon (Gray, Haute-Saone).—The dangers to inexperienced hands, in using the carbonate of soda toning bath, are two-fold. If the bath be used too soon after it is mixed, it rapidly bleaches the prints, giving them a mottled meally effect. It delayed too long after it is mixed, it becomes altogether inert, and will not tone all. 2. The chief drawback of the albumen and beer process is the fact that beer is a variable compound. It would be troublesome and difficult to ascertain with even proximate accuracy the precise elements to use in the place of beer in conjunction with albumen. Possibly, albumen and coffee may prove a good substitute. For this, take the white of one egg, water one ounce, and fifteen drops of ammonia. Beat well. Mix this with four ounces of coffee solution, made by adding a tablespoonful of good coffee, to four ounces of water, and boiling. Filter. Use a good bromo-iodized collodion and ordinary bath. Wash well with distilled water. Apply preservative, and dry spontaneously. Develop either with acid or alkaline pyro, according to formulæ we have often published. Perhaps there is no process superior to the Taupenot, the plates keeping well, and giving very fine results. But they are somewhat tedious in preparation. The tannin process is slow, and gives hard poor pictures.

British Oak has never tried a dry process, and wishes us to select him one with certain characteristics. The plates must be easy and quick to prepare, and they must possess certainty of result. They must also be as rapid as possible, and preferably admit of iron development. He would like an emulsion process, as the plates seem to be easily and quickly prepared. Now a very large number of our readers would like to possess such an easy, simple, rapid, and certain process; but the combination is not easily attainable. Certainty is rarely attainable, and such approximation to it as may be attained is the result generally of experience, and is denied to the novice. Rapidity is generally accompanied by risks, as the same conditions which give extreme sensitiveness to light generally give sensitiveness injury, fog, &c. Ease and quickness of preparation are rarely compatible with other good conditions, especially to a beginner. Few of the dry processes are successful with iron development. The emulsion processes certainly admit of quick and easy coating of the plate; but that is the very least and most unimportant part of the process. We can best serve "British Oak" by giving him a few details about some processes, and leave him to select that which seems best suited to his especial purpose, suggesting, at the same time, that success in any of them depends on care, perseverance, and experience. The gum-gallic process, as described by Mr. Manners Gordon, is a simple and rapid process, admitting of iron development, and in his hands it was very certain. The coffee process is very easy and simple, but not very rapid, and does not admit well of iron development. The collodio-albumen process is the most certain we know, but it involves the most trouble in preparation. Several of the emulsions processes are very excellent, but they require considerable experience to acquire certainty.

W. R. P. Jeffrey.—We can only suppose that the brass had been of very bad quality. It should consist of an alloy of copper and tin. It too often consists of zinc instead of tin.

B. D.—We regret that we cannot help you, as we have never met with such a result. The fact that the defect comes at times, and is at other times absent, under apparently the same conditions, is perplexing Observe more carefully; you will probably find some variation in the conditions.

F. M. S. (Whitby).—We should decidedly prefer the ridge-roof plan, as securing the greater amount of advantage, and the general arrangement of it seems very good; but we should prefer to avoid the portion of ground glass in the roof, and substitute for it a white blind in sunny weather. In this country dull weather so often prevails it is undesirable to shut out permanently light which might often be useful, and could only be troublesome in very bright weather. 2. Perhaps about £5 each. It is difficult to estimate the value of things for which there is no fixed standard. The value chiefly consists in the probable profits they would produce. We are glad you are partially through the last disastrous adventure.

An Amateur of Six Months.—The blue spots have been produced by some accident for which we cannot account. We have not met with such before The portrait lacks detail in the face; otherwise it is pretty good.

Several correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. H. **Pointer**, Brighton,
Seven Photographs of Cats in Various Positions.
Mr. J. **Chancellor**, Dublin,
Photograph of Duke of Abercorn.
Mr. H. **Gregson**, Luton,
Four Photographs of Rev. J. Tuckwell.

The Photographic News, April 28, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Scientific Research under Difficulties—Waves of Light—International Exhibition—Photography at the Patent Office.

Scientific Research under Difficulties.—While Professor Vogel is regretting that in the dull light of the North difficulties fall in the way of experimenting with the sun's rays, our friend Captain Waterhouse writes to us from Calcutta that investigations of the same kind undertaken in the Tropics are not unalloyed pleasures. You have no sooner got over the rainy season, and suffered all sorts of drawbacks from the floods that pour down with such unremitting vehemence, than it begins to grow hot again, and any work at all undertaken at mid-day becomes a burden. Unfortunately, Captain Waterhouse's labours have, all of them, to be undertaken when the sun is shining, and, therefore, unlike most Europeans in the hot season at Calcutta, the Deputy Surveyor-General of India has to be up and doing, while his countrymen are engaged in their noon-day's siesta. Our readers are aware of the valuable and interesting results which Captain Waterhouse has secured with collodion plates impregnated with eosin, and how he has not only been able to repeat Professor Vogel's experiments, but to add further to our knowledge of the action of coloured rays upon a sensitive photographic film. Professor Vogel, it will be remembered, attributes the increased sensitiveness of the silver film for coloured rays to the absorption action of certain pigments which he mixes with the collodion; while Captain Abney (who has also secured films with an increase of sensitiveness for the red and ultra-red end of the spectrum) believes the result to be due to an organic silver compound, formed by silver combining with a resin he introduces into the collodion. Captain Waterhouse (who is pursuing an independent investigation at Calcutta) has obtained results which, so far, confirm Professor Vogel. His eosin experiments are most interesting, and the circumstance that he gets the ultra-red lines depicted upon his plate darker than the ground (instead of lighter) is another matter of considerable importance. The fact that there are at present three competent and careful workers upon this interesting problem leads to the belief that we shall not long remain without a satisfactory solution of it. That under certain circumstances bromide of silver can be made more sensitive for the red lines of the spectrum seems to be agreed upon by all three, and this is a great step onwards, for when Dr. Vogel proclaimed the fact two years ago, there were several who disputed it. Whether the increase of sensitiveness is due to a purely chemical cause, as Captain Abney avers, or whether there is an optical reason for the same, as Professor Vogel believes, and as Captain Waterhouse's results also seem to indicate, is the question to be settled, and a very interesting question it is. We hear with much pleasure that it is the intention of Captain Waterhouse to pay a visit to this country some time in the autumn, having well earned a period of rest and repose at home, after a dozen years spent under an East Indian sun.

Waves of Light.—Some interesting experiments have been undertaken upon light by M. Lippich, who publishes his results in the proceedings of the Vienna Academy. According to this investigator, the theory hitherto held upon the subject of light vibrations is erroneous, and the deductions he makes are at perfect variance with those of M. J. J. Müller, published some little time ago. M. Müller set himself to find out whether light and sound acted in an analogous manner, or, in other words, whether the wave-length of light—as in the case of sound—depends upon its intensity, and whether, in the case of intense light, the wave-lengths increase and decrease as the illumination loses its power. M. Müller concluded this to be the case from the results he secured, and gave it as his definite opinion that the wave-length of light increased with its intensity. This theory has now been upset by M. Lippich. The arrangements he made use of to test the matter were very finely adjusted, and, according to his calculations, about two thousand times more trustworthy and accurate than those made use of by Müller. These results go to show that in whatever medium the light may be—that is to say, whether it is in a ponderable medium, as in the atmosphere, or in a vacuum, which, according to latest authority, contains what is termed only luminous ether—the length of the waves is quite independent of the intensity of the light. The light vibrations, M. Lippich avers, may be intense without the wave-lengths increasing, and consequently the latter depend not upon the quantity, but the quality, of the light. Such teachings as these demonstrate how very little we at present know of the agent called light; even the theory of regarding it as an ether capable of penetrating solid bodies requires some amount of imagination to be thoroughly believed in.

International Exhibitions.—It is hard to understand sometimes why photographers take the trouble to send to International Exhibitions, or, for the matter of that, why anybody at all can be found to do so. The worry and trouble, to say nothing of the expense, of forwarding articles, are always very great, and in the case of the Philadelphia Exhibition, owing to the strict Customs regulations of the country, the exhibitor's difficulties seem to have increased tenfold. Paper after paper has to be signed and declarations made, until one grows weary of the whole affair, and begins to enquire of oneself, what are to be the advantages that will accrue from all the anxiety and money given out. In the case of manufacturers and tradesmen who carry on a flourishing business through the medium of an agent, who stands at the show case ready to answer enquiries, we can readily understand that it is worth while going through a good deal of labour to have one's objects put properly before the public, so that they may be well seen and appreciated. In fact, in the later exhibitions that have been held, and more especially the annual ones at South Kensington, the affair simply took the form of a huge shop or bazaar, where trading could be carried on rather better than at home. It will be remembered that many, and our West-end tradesmen especially, protested very vehemently against the spending of public money in providing splendid shops for such manufacturers as were fortunate enough to get hold of them, and indeed this wholesome opposition had the effect, as we know, of ultimately bringing these annual bazaars to an end. In the case of a photographer, he has little to gain by forwarding pictures to an International Exhibition, for he could never hope, were he of a mercenary turn of mind, to do a large international business in consequence. So that if future exhibitions are to be well represented, it will be necessary, we think, to do away with the vexatious regulations which now beset the path of exhibitors, for otherwise the slight inducements which people have in sending their exhibits will be far outweighed by the inconveniences and disagreeables attending such a course.

Photography at the Patent Office.—Gradually Government is adopting photography in public offices, where its aid cannot fail to be of use. We have many times pointed out directions in which the camera could be of assistance in certain departments of the State, and have shown how, sooner or later, it will be necessary to have photographers attached to the law courts to produce photographic evidence, and to satisfy questions of identity. For securing *fac-similes* of documents when the originals cannot be brought forward, or to produce views of places of interest in a trial, an official photographer would often be welcome, and we note with satisfaction that in the case of the Patent Office, steps have already been taken to secure the aid of photography. In Chancery Lane, in close proximity to the Patent Office, a photographic studio is about to be rected, in accordance with a scheme which has been put before the Commissioners of Patents, who are desirous of rendering everything in connection with specifications and descriptions of inventions as clearly and accurately as possible. Henceforth all drawings and sketches attached by patent agents to the specifications will be photographed, in order to secure duplicates of them, instead of, as heretofore, copying them by lithography. No copying by hand can, of course, be so accurate as the delineation by means of the camera, and the employment of this instrument, therefore, will prevent any error or mistake from creeping into a reproduction. Moreover, the copy will be a true transcript of the original, and bear any signature or private marks possessed by the latter. A photo-lithographic process will, no doubt, be employed if many copies of a specification are to be printed, and we hail with pleasure such a method of reproducing plans in so accurate a manner. Col. Stuart Wortley (who, as most of our readers are aware, is the curator of the Patent Museum) will, no doubt, be entrusted with the superintendence of this interesting department.

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A QUICK DRY PROCESS WHICH HAS NEVER PRODUCED BLISTERS.

BY J. BRIER, JUN.*

DID not intend to publish the dry process I have been working lately, as there are now so many that any one who has not made himself master of one or other of them has great difficulty in deciding which to use. It is perfectly impossible to try them all; but after experimenting a long while, and having plenty of failures, we get to know the causes of success and failure, and can tell by reading, without further trial, whether a process is of much use or not.

I have had years of hopeless failures with dry processes, particularly with collodio-bromide, and I never had much success till I tried Cassava gum as a preservative. Mr. Adin wished me to read a paper, and as I have had no opportunity of practising photography lately, I will give you the process as I last prepared plates by it on Sept. 14th, 1875. Those plates have been used for trial of keeping qualities, and, after seven months, are as good and sensitive as when prepared. With strong alkaline development, these films are more sensitive to weak rays of light than any dry process I have tried, except gelatino-bromide. For ordinary landscape work they are three or four times as slow as the wet at its best—slower still for interiors—but quite as quick as wet in strong sunlight with an open rapid rectilinear lens.

I will first say a few words about the materials used. Cassava gum is a light cream-coloured powder, extensively used in calico printing. I find it best calcined for three or four hours in a tin in an oven until it is the colour of dark yellow ochre. It is then soluble in cold water. The solution in three months neither decomposes nor throws down a precipitate, both of which a solution of dextrine will do. Dried in flakes, it is only second in solubility to gum arabic. The albumen mentioned is always the well-known preparation of Mr. Ackland. The sugar-candy must be free from salt, the acetic acid from sulphuric, and the water from iron. The collodion must be thin, quick-setting, and of a powdery nature, containing rather less than the usual quantity of iodide, and about two or three grains of bromide per ounce, according to the base of the bromine salt.

All last year I used successfully a mixture of three ounces of Mr. Payne's negative collodion, one ounce of Rouch's collodion, bromized only, and half-an-ounce of pure ether, sp. gr. ·725. I keep the collodion in a filter, and decant carefully into three wide-mouthed pouring bottles for use, adding a little ether, and returning it into the top part of the filter when done with. The glasses have the edges drawn over a smooth stone at an angle, and are then cleaned in hot, weak soda, followed by a long steep in weak nitric acid. They are then rubbed with a clean rag, rinsed well, and dried with clean cloths. I only do six at once, pick out the best side, and give that a breath and an extra polish, and then put in pairs, best sides face to face. Mix one drachm of albumen with four ounces of distilled water, filter into a dish, and lower the face of the plate on to the albumen by means of a pneumatic holder. The edge lowered first must also be raised first, and there will be no bubbles. This is Mr. Swan's method, and is the best and easiest I have tried. The plates as they are coated are put in a rack to drain diagonally, and when slightly drained they are put in another kind of rack, one corner resting on clean filter-paper. This is put in the drying-box, and left to dry spontaneously.

Next, there is a box containing three glass baths, with dippers of glass rod one-eighth of an inch in diameter, doubled at an angle of fifteen degrees, and the extremities made into hooks. These never cause marks in the film, as a bad dipper always does. The first bath contains a neutral, fully-iodized, well-filtered, thirty-grain silver solution, the second a sixty-grain ditto, and the third pure distilled water filtered. Coat a plate with collodion, and let it set well; immerse it in the No. 1 bath, thick end of the film upwards, while the plate is sensitizing. Mix one drachm of albumen with twenty minims of a pure forty-grain solution of silver nitrate, stir well, and leave it exactly two minutes; then add thirty minims of ammonia, sp. gr. ·880, and fill up to two ounces with water, let settle, and use clear solution. The plate is to remain from three to five minutes in No. 1 bath, then from five to eight minutes in No. 2, from four to five minutes in No. 3, and is then put on a holder and washed for a minute under a very fine rose. Drain, and flow well for one minute with two drachms of the silver albuminate solution; wash another minute under the rose, then flow with glacial acetic acid one drachm, and water, ten ounces. Wash under the rose till greasiness disappears, and swill with distilled water; drain, and apply the preservative four times, flowing from a different corner each time. The plate is now put in another rack, the long, thick edge of the film resting on filter-paper, and the holder released to go on with another plate.

The working is so arranged that all the baths have plates in at once, and when all are finished, and the rack full the drying-box is closed, and left at least twenty-four hours; if opened while the plates are wet, drying marks are caused. The object of first drying the plate in a diagonal position, next immersing in a vertical, and, last, drying with the long edge horizontal, is to show at what stage of the process any spots, streaks, or comets are caused by the direction in which they run. The use of the three baths is absolutely necessary to prevent dripping streaks, which are caused by the bad grace with which ether mixes with water and aqueous solutions. The flow of acetic acid is of more importance to the keeping qualities of these films than any other operation; many otherwise good processes are spoiled by leaving an alkali present, which oxidizes the de-oxidizing agent intended to absorb the iodine and bromine, and so renders the plates worthless in a few days.

To make the preservative grind up one ounce of calcined Cassava gum, half-an-ounce of pure tannin, and half-an-ounce of sugar-candy. This will keep for years or for ever. For use take forty grains of the above, dissolve in one ounce of hot distilled water, cool, filter well, and it is fit for use, and will keep many months by adding a drop of carbolic acid. When the plates are dry, give them a warming on a hot-water tin, and paint on the backing, which is made by grinding about equal parts of Bates's black varnish, india-rubber solution, lampblack, and a little benzine. If properly made, this dries quickly, will not rub off, parts with no dust, and though water is not its solvent, yet a damp rag or sponge easily rubs it off in lumps.

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* Read before the Manchester Photographic Society.

To develop the plates, have ready a dip bath full of water, a freshly-made eighty-grain solution of crystalline carbonate of ammonia, a twenty-grain solution of potassium bromide, some good dry pyro., the acetic acid water as used in the preparation, a solution of ten grains of pyro. and ten grains of citric acid in eight ounces of water, and some old bath solution. Rub off the backing, and immerse the plate in the bath. Take for an 8 by 5 plate, two drachms of ammonia carbonate solution, and add from one to five drops of bromide solution, according to the subject—three drops being an average—and a grain or so of dry pyro. Wash the plate well, and apply the above quickly, move about well until sufficient detail is out in the shadows, then wash, flow with the acid water, and intensify with pyro., citric, and silver as usual; but do not make the image too intense, as the colour is very non-actinic like all collodio-albumen negatives. Do not let the edges or corners get dry during development, washing, or fixation, or there will be uneven places called "stains." Fix in clear, neutral hypo., wash very well, and dry by heat, as it gives a better colour than spontaneous drying. These films do not blur more than Taupenôt ones, if they contain as much iodide; but I prefer to back all dry plates, for on difficult subjects I have had blurring in Taupenôt films.

To save trouble I may mention that small quantities of Cassava gum may be obtained from Mr. J. B. Payne, or in casks of sixteen or seventeen cwt. from Messrs. Thomas Hyland and Co., 50, Fountain Street.

I had forgotten to mention that my drying-box is an old packing case, painted red, fitted with a light tight, but not air-proof, door, and a ventilator on the top.

THE MECHANICAL ACTION OF LIGHT.

BY WILLIAM CROOKES, F.R.S., ETC.

[We have been favoured by Mr. Crookes with the following abstract of Part III. of his paper on this subject, from the "Proceedings of the Royal Society." The details will be full of interest to our readers.]

This paper contains an account of experiments on the action of radiation on bodies, the surfaces of which have their radiating and absorbing powers modified by various coatings. The difference between a white and a lamp-blacked surface, in this respect, was at first not very decided; and experiments have been instituted with the object of clearing up some anomalies observed in the actions. Two pith disks, one white and the other black, were suspended on a light arm in a glass bulb by means of a fine silk fibre; after perfect exhaustion, the white and black disks were found to be equally repelled by heat of low intensity, such as from the fingers, warm water, &c. A copper ball was then tried at gradually increasing temperatures. Up to 250° C. it repelled both equally, above that the black was more repelled than the white, and at a full red heat the repulsion of the black disk was very energetic. A lighted candle acts with more energy than the red-hot copper.

The presence of even a small quantity of aqueous vapour in the exhausted apparatus, almost, if not quite, neutralizes the more energetic action which luminous rays appear to exert on a blackened surface.

After describing several different modifications and some new forms of apparatus devised to facilitate experiment, the author gives a drawing of an instrument which enables him to get quantitative measurements of the amount of incident light falling on it. It consists of a flat bar of pith, half black and half white, suspended horizontally in a bulb by means of a long silk fibre. A small magnet and reflecting-mirror are fastened to the pith, and a controlling magnet is fastened outside, so that it can slide up and down the tube, and thus increase or diminish sensitiveness. The whole is completely exhausted, and then enclosed in a box lined with black velvet, with apertures, for the rays of light to pass in and out. A ray of light reflected from the mirror on to a graduated scale shows the movements of the pith bar. The degrees of deflection produced by the light of a candle at distances from 6 feet to 35 feet are given.

The experimental observations and the numbers which are required by the theoretical diminution of light with the square of the distance are sufficiently close, as the following figures show:—

Candle	6 feet off,	gives a deflection of	218 degs.
,,	12 ,,	,,	54 ,,
,,	18 ,,	,,	24·5 ,,
,,	24 ,,	,,	13 ,,
,,	10 ,,	,,	77 ,,
,,	20 ,,	,,	19 ,,
,,	30 ,,	,,	8·5 ,,

The effect of two candles side by side is practically double, and of three candles three times that of one candle.

The action of various solid and liquid screens is next given.

A candle three feet off, giving a deflection of 180°, has its action reduced to the following amounts by—

Yellow glass	161
Blue ,, ...	102
Green ,, ...	101
Red ,, ...	128
Water ,, ...	47
Alum ,, ...	27

A candle on each side of the apparatus, and equidistant from it, keeps the index ray of light at zero; by shading off either one or the other, the light flies off to either extremity of the scale. This gives a ready means of balancing two sources of light, one against the other. Thus, retaining the standard candle 48 inches off on the left of the bar, the index was brought to zero by placing on the right

2 candles	67 inches off
1 candle behind solution of sulphate of copper ...	6 ,,
1 candle behind alum plate	14 ,,
A small gas-burner ...	113 ,,

These experiments show how conveniently and accurately this instrument can be used as a photometer. By balancing a standard candle on one side against any source of light on the other, the value of the latter in terms of a candle is readily shown: thus, in the last experiment, the standard candle 48 inches off was balanced by a gas-flame 113 inches off. The lights were, therefore, in the proportion of 48^2 to 113^2, or as 1 to 5½. The gas-burner was, therefore, equal to 5½ candles.

By interposing screens of water, or plates of alum, and so practically cutting off all the dark heat, the actual luminosity is measured. In addition to this, by interposing coloured glasses or solutions, any desired colours can be measured, either against the total radiation from a candle, its luminous rays, or any desired colour. One coloured ray can be balanced against another coloured ray by having differently coloured screens on either side.

The variations in the luminosity of a "standard" candle will cease to be of importance. Any candle may be taken; and, if it be placed at such a distance from the apparatus that it will give a uniform deflection, say of 100 divisions, the standard can be reproduced at any subsequent time; and the burning of the candle may be tested during the photometric experiments, by taking the deflection it causes from time to time, and altering its distance, if needed, to keep the deflection at 100 divisions.

If the pith bar in this instrument be blacked on alternate halves, an impetus given by a ray of light always acts in the same direction of movement. A candle causes it to spin round very rapidly, until the suspending fibre is twisted up, and the rotation is stopped by the accumulated torsion.

By arranging the apparatus so that the black and white surfaces are suspended on a pivot, instead of by a silk fibre, the interfering action of torsion is removed, and the instrument will rotate continuously under the influence of radiation. To this instrument the author has given the name of the "Radiometer," or "Light-Mill." It consists of four arms of very fine glass, supported in the centre by a needle-point, and having at the extremities thin disks of pith lampblacked on one side, the black surfaces all facing the same way. The needle stands in a glass cup, and the arms and disks are delicately balanced, so as to revolve with the slightest impetus.

In the "Proceedings of the Royal Society" for 1875 (vol. xxiii. p. 373), the author gave a brief account of some of the earlier experiments with these instruments. In the present paper he enters very fully into the various phenomena presented by them, and gives tables showing the number of revolutions made by the radiometer when exposed to a constant source of light removed different distances from the instrument. The law is that the rapidity of revolution is inversely as the square of the distance between the light and the instrument.

When exposed to different numbers of candles at the same distance off, the number of revolutions in a given time are in proportion to the number of candles, two candles giving twice the rapidity of one candle, and three giving three times, &c.

The position of the light in the horizontal plane of the instrument is of no consequence, provided the distance is not altered; thus two candles one foot off give the same number of revolutions per second, whether they are side by side or opposite to each other. From this it follows that if the radiometer is brought into a uniformly lighted space it will continue to revolve. This is proved to be the case by experiment.

The speed with which a sensitive radiometer will revolve in full sunshine is almost incredible. Nothing is apparent but an undefined nebulous ring, which becomes at times almost invisible. The number of revolutions per second cannot be counted, but it must be several hundreds, for one candle will make the arms spin round forty times a second.

The action of dark heat (*i.e.* from boiling water) is to repel each surface equally, and the movement of the radiometer is therefore arrested if a flask of boiling water is brought near it. The same effect is produced by ice.

From some observations made by the author, it appears probable that heat of a still lower refrangibility repels the white more than it does the black surface. Many instances are given of the radiometer revolving the reverse way. Thus breathing gently on the instrument will generally cause this effect to be produced.

An experiment is described with a radiometer, the moving parts of which are of aluminium, blacked on one side. When exposed to the radiation from a candle the arms revolve the normal way. On removing the candle they revolve the reverse way. Heated with a Bunsen burner, the arms revolve the normal way as they are getting hot; but as soon as the source of heat is removed, and cooling commences, rotation sets up in the reverse way, and continues with great energy till the whole is cold. The reverse movement during the cooling is apparently equal in energy to the normal movement as it is being heated.

It is easy to get rotation in a radiometer without having the surfaces of the disks differently coloured. An experiment is described with one having the pith disks blacked on both sides. On bringing a candle near it, and shading the light from one side, rapid rotation is produced, which is at once altered in direction by moving the shade to the other side.

The author describes many forms of radiometer, by means of which the movements can be exhibited to a large audience, or can be made to record themselves telegraphically on a self-recording instrument.

Recent Patents.

IMPROVEMENTS IN PHOTO-ENGRAVING.

BY PAUL EMILE PLACET.

[The following specification describes a series of improvements in producing naturally grained surfaces for purposes of photo-mechanical printing. The details will possess much interest for experimentalists in photo-engraving.—Ed.]

The processes as a whole, which I am about to describe, enable me by the aid of certain chemical re-actions to obtain engravings possessing naturally the grain which is indispensable when it is wished to use the ordinary means of impression. The following are the principles on which depend the production of these grained engravings:—An animal or vegetable substance is dipped first into a liquid which has the property of dissolving it, and then into a second liquid having a tannin or contracting property; the whole surface of that substance is soon covered by a grain caused by the contractions which the substance undergoes. The thickness, form, and depth of this grain vary according to the substances and the liquids employed, according to the duration of immersion, the temperature and the degree of concentration of the liquids.

1st. For example, a sheet of gelatine being dipped first into a saturated solution of bichromate of potash, and then into a second solution thus composed:—Sulphate of iron 40, acetic acid 10, water 100. In a few moments the surface of the sheet of gelatine is found to be covered with a magnificent and very uniform grain. In certain cases the dissolving and tannin substances may be applied in the form of solids reduced to powder.

Secondly. If on this sheet of gelatine a drawing has been previously printed or traced in varnish or fatty matter, and the sheet of gelatine be plunged into the two above-mentioned liquids, in this case a surface is obtained which is grained everywhere with the exception of those parts occupied by the drawing, and the pressing of that surface, or its reproduction by electrotypy, gives a surface fit for printing or any other use.

Thirdly. If instead of forming the design by hand a light be used to form it, a sun engraving is obtained. For this it is sufficient to sensitize the sheet of gelatine, and to expose it to light under a negative or cliche in the ordinary manner before plunging it into the liquids above mentioned. In this case the light renders each point of the gelatine layer more or less permeable to the liquids, according to the corresponding intensity of the negative. It follows that the liquids, penetrating more or less deeply into the gelatine, produce in each point a grain of a size and depth proportional to the corresponding intensity of the negative or cliché, so that by this means a sun engraving is obtained, which is a faithful reproduction of the photograph with all its details and its smallest gradations of tints.

Such is the nature of the processes of engraving which I claim to have secured to me by the hereinbefore in part recited Letters Patent, whatever may be the substances employed, the mode of operation, and the various applications.

The following are examples of several modes of operating:—

First. I take a loaf of gelatine paper, and sensitize with a bichromate in the ordinary manner. After having exposed this leaf to light under a negative or cliché, I dip it into the saturated solution of bichromate of potash, then rapidly removing the excess of liquid with a cloth or blotting paper I plunge it into the solution of sulphate of iron mentioned above; instantly the design is developed and grained. A few seconds suffice if the exposure to light has been suitable. It is dried, and the engraving is finished. Nothing remains but to press it by some means to have at once a plate which may serve either for impression or for any other use.

Secondly. I take a paper covered with a layer of gelatine, sensitize it, and expose it to light under a negative or "cliché" in the ordinary way. Then I placed the paper on another surface, either flexible or rigid, so as to be able to develop the image on the reverse side. The reversed proof is then developed in a solution of bichromate of potash, which dissolves out all the parts of the gelatine which the light has not modified, and when the image has sufficiently come out it is plunged into the solution of sulphate of iron, where it is covered with grain ready for moulding.

Thirdly. A proof in gelatine, called "carbon," obtained by ordinary means, may even be grained. To accomplish this it suffices to let the proof remain some time in a solution of ammonia, then in a solution of potash, of hypochloride of lime, or any other solution having the property of re-dissolving the gelatine rendered insoluble by light. The proof is then plunged into the solutions of bichromate of potash and of sulphate of iron, where the grain quickly appears, especially if the solutions have been warmed.

Fourthly. In certain cases it is advantageous to operate on plane and rigid surfaces. Then the gelatine is run over plates of glass, metal, or of any other substance. The gelatine may be sensitized at the moment of running over the plates, or only after being dried. The operation afterwards is like that described for gelatinized paper.

Fifthly. The tannin material may also be applied in the solid state. In this case, after having plunged the layer of gelatine into the first dissolving solution, the image is developed by placing its surface in contact with a tannin powder, or one having a strong affinity for water, such as gallic acid, tannic acid, alums, sulphate of iron, lime, cements, several chlorides, and other substances capable of producing a chemical reaction in presence of the bodies already existing in the layer of gelatine. The metallic powders are in this category. Substances acting as solvents may equally be used in the solid state by employing them in the form of powders on the gelatine slightly wetted.

In the preceding descriptions gelatine has only been indicated by way of example, in order to facilitate the explanation of the different methods. With more or less advantage instead of gelatine gums, albumen, dextrine, isinglass, sugar, caramel, glucose, casein, starch, gluten, juices or various extracts, bitumen, soaps, resins, or other analogous substances, can be used. It is often preferable to employ a mixture of two or several of these substances. The difference of solubility of the mixed substances favours the formation of the grain. All these substances, moreover, may be considered, even in the pure state, as being a mixture in variable proportions of a soluble body, and of a body less soluble. Thus gelatine is always composed of a certain part soluble in cold water, and of another part insoluble. The gelatines found in commerce are always variable in their composition, consequently the nature of the grain they produce by the methods above described often varies from one operation to another.

In order to obtain results always constant and regular, it is preferable not to use pure gelatine, but to mix it with a certain proportion of gum, albumen, dextrine, &c., or, better, with soluble gelatine, which gives a more homogeneous mixture. This soluble gelatine is obtained by treating ordinary gelatine with an acid, or by prolonged boiling.

The following is a mixture and a manner of working which answer very well for the reproduction in sun engravings of the most delicate photographs. It is only an example; it is evident equally successful results might be obtained in other ways.

Sixthly. On a plane surface the following mixture is poured:—Gelatine, 10; soluble gelatine, 1 to 2; water, 100; sugar, 1 to 3; bichromate, 1 to 2. Sometimes a small quantity of acid is added, such as chromic acid, acetic acid, citric or other acid. It is allowed to dry, and exposed to light under a negative or positive photograph, according to the kind of engraving intended to be produced; the proof is then dipped into pure water, or into water rendered denser by means of borax or other matter. The image will be instantly developed and grained.

To stay the action of the liquid the proof is plunged rapidly into the following bath:—Water, 100; alcohol, 20 to 30; ammonia, 2 to 4. It is wiped immediately with blotting-paper, and left in darkness until completely or nearly dry. Then it is dipped into the solution of sulphate of iron already mentioned. The grain forms afresh, and when the proof is perfectly developed it is plunged into pure water or into water slightly acidulated. To stay the development it is dried, and the grained image is then indefinitely fixed and finished.

During the development the size and depth of the grain can be varied, according to the subject treated. For this purpose two or even three solutions are prepared beforehand, containing different quantities of sulphate of iron and of acid. The development is commenced by the solution which has the least action, and is continued with one or other of the solutions, according to the result desired to be obtained.

It will be seen by what precedes that the substances used a solvents necessarily vary with the substances used. They are water, acids, salts of all natures, alcohol, ether, oils, essences, &c., and mixtures of these bodies. The tannin matters vary also according to the substances employed. They are gallic acid, tannic acid, salts of alum, chrome, zinc, iron, especially the sulphate and nitrate of iron, all astringents, all bodies having affinity for water, even in the solid state, lime in powder and cements, the chlorides of sodium, calcium, mercury, platinum, lastly alcohol, ether, essences, &c. Thus, for example, alcohol forms a very fine grain on a mixture of gum-lac in solution in ammonia or borax.

In order to render the action of the dissolving and tannin or astringent liquids more prompt and regular, it is often well to add to them a little acid or a chloride, sulphate, nitrate, or other salt. Heat also greatly assists the action of these liquids. To render the substances sensitive to light the salts of gold, silver, chrome, iron, platinum, uranium, mercury, and other metals, and also certain substances of animals or vegetable origin, may be used.

The grained images or designs obtained by means of the processes just above explained may in certain cases be used just as they are obtained either as photographic proofs, or to serve directly for impressions in copper engraving, lithographic or typographic engravings.

A certain number of proofs in oily inks can always be taken from them and transferred to stone or zinc to make lithographs or typographic plates or blocks. The images developed as mentioned above by means of suitable substances may be applied on a metal or other kind of plate, and a perfect engraving produced there by the effect of the chemical reaction which takes place between the plate acting as a support and the substances contained in the image. But mostly those grained designs to be usefully applied to the purposes for which they are intended should be reproduced in a more solid and durable matter. Reproduced by electrotypy they serve for all kinds of typographic impressions, or in copper, on paper, leather, stuffs, wood, porcelain, &c. The grain which these plates naturally possess enables me, by means of copper engraving, to obtain transferred proofs on stone for lithography, and especially transferred proofs on zinc, which are then transformed into typographic plates by known means. The engraved plates obtained by these processes may receive into their cavities incrustations of previous metals, niello engravings, or enamel after the manner of "emaux cloissonnés."

In certain cases these plates present on their surfaces true bas-reliefs, natural sculptures of great beauty. These plates, with appropriate designs, gilt or silvered, can be used for ornamenting the woodwork of apartments, the furniture, cabinets, mantelpieces, &c. These plates, with designs of extreme fineness reproduced in gold, platinum, or silver, may be applied in jewellery or goldsmith's work.

Lastly. These same plates reproduced in resisting metals may be used to figure, emboss, or mould metals, wood, paper, stuffs, leather, glass, porcelain, &c. Moreover the ease and cheapness with which such engravings can be obtained will necessarily lead to new applications which have not been thought of at present because of the high price of engravings done by hand.

The methods of obtaining images naturally grained may be multiplied and varied to infinity, for a very large number of substances produce surfaces rough, striated, crackled, crystallized, or grained by their contact with divers appropriate chemical products.

I do not, therefore, limit myself to the methods above described by way of example, my invention consisting essentially in the producing of naturally grained engravings by the successive use of two actions, one dissolving and the other tannin, contracting, or crystallizing as above set forth, and I reserve the right of varying the substances, the mixture, and the mode of operating. I also reserve the right of applying this kind of engraving to every branch of the arts, sciences, and industry.

The Photographic News.

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PERMANENCY IN SILVER AND CARBON PRINTS.

We conclude in the present number an interesting series of articles by Mr. W. Howard, on "Chromium, Carbon, and Silver," which we commend to the careful consideration of our readers. Mr. W. Howard enters into a minute analytical consideration of the bases of permanency, and the possibilities and causes of instability, in the two distinct and important branches of photographic printing—silver and carbon. He shows theoretically, what experience has only too efficiently demonstrated, the frail and uncertain foundation upon which permanency in silver prints must rest, and the simple conditions, perfectly under control, which give permanency to examples of carbon printing; and he has favoured us with the specimen prints (silver and carbon) submitted to the various tests described in his papers.

As we have frequently remarked, the bane of silver printing has been, not so much that some prints are unstable, as the uncertainty as to which shall be permanent and which fleeting. In a recent article we noted the fact that many prints we had examined had remained unchanged for periods of from twelve to twenty years, and that, as all these were large and important pictures, receiving individual care in fixing and washing, it was a fair assumption that all prints produced with such care would remain stable. But then comes in the element of uncertainty. One important print, which had been printed a dozen years, since examined, is found to be utterly faded, whilst an unmounted print from the same negative, printed at the same time, and since kept in a drawer, is in perfectly good condition. Tending in an exactly opposite direction, but still pointing to the same troublesome uncertainty, was a print shown to us some time ago by Dr. Diamond. It had been printed for about ten years, and was in perfectly good condition, but on removing the mount all the portion covered up from light had disappeared—faded utterly. A few days ago we examined an album of prints produced about five-and-twenty years ago, chiefly by the masters of the art at the time. These were on plain paper, some printed by development, some by the ammonia nitrate process. The diversity of stability they exhibited was more interesting than instructive. Many of them were in perfectly good condition, some had lost tone and become yellow, and some had faded into mere ghosts. We have said that the examination was less instructive than interesting, because such details as we could learn of the history of the prints seemed out of harmony with the results. Those prints which were most completely faded were the work of a photographer whose name was almost a synonym for neatness and precision in his work, Mr. Alfred Rosling. He devoted unusual care and time to the production and washing of his prints, and they are more faded than any others of the same period. Amongst those which had stood most perfectly were the prints of Sir Wm. Newton. These were washed comparatively little; but they had a bath of alum after fixation. It is not our intention to pursue the history of the various prints. We merely cite a few cases illustrative of the uncertainty to which we have referred, and to point out that the first thing to be settled in the search after permanency in silver printing is the precise cause of its absence.

A correspondent who appears to think the time spent in the enquiry as to the means of securing stability in silver prints somewhat wasted, raises another important question as to the absence at present of information which will enable professional photographers to guarantee the permanency of carbon prints. He points out the necessity of the photographer knowing something of the pigments used in preparing the tissue he uses. Referring for a moment to his use of the term monopoly, we may point out the fact that the grounds for confidence in the permanency of the pigments used are much more satisfactory when the manufacture of the tissue is in the hands of one firm. Competition often produces excellence, but it often begets secrecy as to the mode and material employed in the manufacture. Nevertheless the suggestion of our correspondent, that photographers should be permitted to know something of the pigments employed in the tissue they are using, so that they may feel some assurance beyond the mere knowledge that a pigment of some kind is used, in guaranteeing the permanency of their work, is important. Many very beautiful pigments are very fugitive. We have heard of "carbon prints" fading. Of course, pigment printing will not be permanent if fugitive tints have been used in preparing the tissue; but that is not a likely thing to occur. In the early and experimental days, carmine, aniline dyes, and other tinctorial substances were tried to give warmth to the black of carbon, and make it satisfactory to the eye educated on the gold tones of photography. These tints fading, left an image of cold black, sometimes possessing a greenish tint from the presence of sesquioxide of chromium. Experience has altered all this, and, so far as we know, there is no difficulty in obtaining tissue prepared with absolutely permanent pigments of all desirable gradations of colour. It is probable that the Company would prepare to order a quantity of tissue coloured with any available tints which might be desired, say indian ink and one of the madders. Such pigments would be permanent, and in suitable proportions would give a fine colour, but whether superior to the tissues now supplied by the Company may possibly be open to doubt. It is quite certain that the photographer ought, in giving up silver printing, to feel well assured that the materials he must use, in producing his permanent pigment prints, are absolutely free from the risk of fading, and he must also feel assured that his mode of working is based upon an intelligent appreciation of the conditions of success in carbon printing. We believe he may rely upon the firm having the monopoly for the first. For the second, he must rely upon himself and the numerous aids which exist, not the least of which will be a careful study of the articles on "Chromium, Carbon, and Silver."

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FLORAL PHOTOGRAPHY—ORNAMENTAL ENTOURAGE FOR PORTRAITS.

We have recently been favoured with a large series of fine examples of floral photography, the joint production of Mr. and Mrs. S. Glen Payne, of Aylesbury. Curiously enough, the application of photography to the purposes of floral delineation has been very little practised in this country. It is true the successful photographing of either single flowers or groups is not an easy task, but the charming character of the results when success is attained would well repay the effort. The late Mr. Rejlander used to regard the successful photographing of a single flower, doing justice at once to texture and suggestion of colour by tone, as a test experiment, both for the condition of chemicals and manipulating skill in the operator. If the photographer could do justice to the various gradations of tone and texture in foliage and flower, in stem, leaf, calyx, petals, stamen, pistils—he was a master of the technics of his art. If the chemicals rendered all these details perfectly, they were in satisfactory condition.

Possibly the frequent failure in first attempts to do justice to the exquisite textures and gradations upon which so much of the charm of floral beauty depends, has deterred many from prosecuting the task until perfection was attained. The examples before us are exceedingly fine both in technical and artistic qualities, the grouping of the flowers evincing fine taste and a loving interest in the flowers, and the photography is admirably perfect. Perhaps no test of the latter quality is more severe than an attempt to distinguish each special flower in an elaborately massed group. We have no difficulty here in identifying a score or more: we have fine blooms of azalea, primula, epacris, camellia, lily of the valley, tulip, cyclamen, lilac, spirea, tradescantia, eucharis, acacia armata, various roses, several orchids, many ferns, lycopods, and foliage plants. In many cases the grouping surrounds a scroll containing some lines of poetry, or a collect from the Book of Common Prayer. In other cases the flowers are grouped so as to form a cross. All the examples we have received are coloured with a brilliancy rivalling nature. It is probable that well-executed floral photographs applied to various purposes might prove worthy of attention in a commercial sense; but it is certain that it would prove interesting to many amateurs, who might thus combine indulgence in photographic and floricultural pleasures in one operation.

We have also been favoured by Mr. Payne with some examples of their *entourage* negatives, which are exceedingly effective. By the aid of these negatives of various designs, some capital borders may be printed round ordinary portraits; and Mr. Payne, in a letter on another page, points out the commercial value of a plan which enables the photographer to give a new value to the stock negatives. The *entourage*, or border, may be of various designs. In those before us, an oval frame, of a twisted or cord-like pattern, forms the framework, and this is tastefully wreathed at top and bottom so as to secure a fitting design, with ferns, grasses, mosses, flowers, very little of each, but gracefully blended with the shape of the frame. The mode of masking and double printing with such negatives has before been described, and need not be repeated here. The important point in the use of such floral designs is to avoid over-doing the ornamentation. Profusion may become vulgar, whilst the sparing use of a little suitable material gracefully arranged may be made most valuable, and is a form of ornamentation which has not yet received sufficient attention amongst photographers.

SILVER, CHROMIUM, CARBON.

(A Critico-chemical Comparison.)

BY W. HOWARD, ANALYST.

CHROMIUM CARBON.—*Concluded.*

In reviewing the operations of chromotyping and the reactions which they involve, I will make a slight departure from the plan which I sketched at the commencement of these papers. Before pointing out in detail the action of light upon the sensitive agent, and the reaction which takes place where the picture is treated with the alum-fixing solution, I will jot down the results of a few experiments made for the purpose of ascertaining the effect of atmospheric impurities upon chromotype prints. The peculiar and (if I may so term it) dual nature of the chromotype image makes this arrangement the most convenient one to adopt. The peculiarity to which I refer is this: a chromotype actually consists of two images, or rather of one image possessing two distinct constituents.

As a product of the action of light it is formed (as I have before hinted) by the decomposition of gelatine and a bichromate, and the consequent formation of a chromium oxide. Such an image, though it may possess much interest for the experimentalist, is, from the artistic and commercial point of view, utterly valueless. By combining with the sensitive mixture a third body which takes no part in the chemical action, being simply entangled in the insoluble gum then produced, the picture for which we wish is obtained, and the character of this third body is perhaps the point to which any tendency to impermanence would be traced. If it can be shown that a chromotype print does not suffer in purity of colour by the action of those agents which pollute our atmosphere, this colouring matter (being inactive) may be totally disregarded when the chemistry of the process is under consideration.

Were the third element of the trio which give the title to these essays the only material employed for the purpose of giving body and colour to chromium pictures, it would not be necessary to offer any experimental evidence of their stability. Carbon, pure and simple, is, under ordinary conditions, the most stable of elementary bodies. The exigencies of the artist, however, call for tones of a more pleasing hue than can be given by carbon alone. It is demanded by the educated and critical eye that the fatal beauty of the gold-toned print shall be rivalled or eclipsed. The earliest work of the process was produced by the use of carbon alone as a colour-giving agent, and the inartistic tone afforded by this element was legitimately condemned as inadmissible for pictorial purposes. The process—in itself possessing the inherent excellent qualities of simplicity of manipulation, rapidity of production, and certainty of result—was readily recognized to offer capabilities before undreamt of in the arcana of photography. Various tinctorial substances were called into requisition to modify its tone, and, in the case of the most recent development of the process, even metallic powders have been used to conduce to that end, and with excellent effect.

The best friends of the process, those who are desirous that its *raison d'etre*, *permanency*, should not be lost sight of, have asked, with a fair show of reason, "Are not these agents liable to undergo change?" Upon first sight this question appears to demand an affirmative answer; tinctorial bodies, notably the aniline dyes, are prone to oxidation, and metallic powders, with few exceptions, are liable to sulphurization. An examination of the conditions under which these bodies exist in the picture will soon dissipate such fears, and enable us to return a negative reply to these enquiries.

The film or tissue of oxidized gelatine which encloses and gives form to these substances, is not only insoluble, but even impervious to gases, when due care has been observed in manipulating the production. Besides this in the latest phase of the chromotyper's art, the picture is further defended from atmospheric ravage by a coating of collodion. If, then, as these considerations seem to indicate, gases from without are rendered powerless for harm, it may be easily conceived that even aniline colours could be used if no apprehension existed of the possibility that oxygen might be evolved in the picture.

That oxygen may be generated in the picture may, for the sake of argument, be provisionally granted, but, as I shall shortly show, this may be avoided by proper precaution, and, probably, even aniline used as a toning agent.

These views regarding the introduction of metals and other colouring bodies into the tissue I have long held, but before giving them utterance, I thought it prudent to apply the ordeal of experimental test. The prints which I have used for experiment were produced upon tissues possessing all the newest tones, and to make the ordeal more trying, they were not coated with collodion or varnish.

I will not individually enumerate these trials, but refer my readers to the details of the experiments which in a prior issue I described when speaking of silver prints. the order of which I strictly followed. In no instance did any degradation of tone occur in the chromotypes used. Any comment upon these results would be hypercritical.

Now we may proceed to investigate the change which light produces when gelatine and a bichromate are brought into contact. The views which I will shortly place before you, were deduced from carefully made experiments. Potassium bichromate, being the salt in general use, was the sensitive agent to which I turned my attention; any observations which apply to it will in the main be true of ammonium bichromate. My method of procedure was as follows:—A mixed solution of gelatine and bichromate was prepared, the strength being that recommended by Col. Sir Henry James, for his photo-zincograph process. This formula was convenient for the purpose, because the bichromate in it is so proportioned as to ensure proper oxidation of the gelatine. Sheets of plain paper of good quality were floated twice upon this solution, and may be regarded as our tissue.

At this the very outset of the *chromium processes*, a fundamental difference between it and the corresponding operation in *silver-printing*, calls for notice. The result of sensitizing a paper with silver is the formation of an insoluble compound, in the case of sensitizing a tissue, the bichromate is simply absorbed by the gelatine not forming a compound, and the mixture remains perfectly soluble. Another phase of divergence from the characteristics of the sensitive silver salts is manifested by the chromium salt, viz., the condition most favourable for producing an impression is obtained when the sensitized tissue is absolutely dry, while silvered paper prints very slowly, unless some moisture is present.

The decomposition which light effects when a bichromate is diffused through an organic tissue progresses with, at least, three times the rapidity which marks a sensitive silver paper. The ultimate result of this decomposition is identical with that produced by high temperature, viz., neutral, potassium chromate and chromium sesquioxide are produced, oxygen gas being eliminated.

In actual practice this degree of deoxidation is seldom reached; indeed, if it is effected the result is an overprinted tissue, and consequent difficulty in developing. If, instead of a black or dark coloured tissue, a plain mixture of the sensitive agents, such as I have described, be used, the progress of the decomposition marks itself by the changes of colour produced on the portions to which light has access. The colour of an image on such a paper (as I have found by counter experiment with the same negative and tissue), when in the state most favourable for development, is warm brown. Evidently this cannot be sesquioxide, but, as I will show, by proper management, it is converted into that oxide by the succeeding manipulations. With tissue the operation which follows exposure consists in attaching the still invisible picture to a temporary support before proceeding to develop and fix it. Then follows simple washing with warm water, which effectually removes the whole of the materials which have not been used in forming the picture, leaving the whites totally free from anything which would degrade their purity on subsequent exposure to the action of light or gases. The simplicity of this operation, which at once gives a perfect picture, absolutely free from the substance which produced it, and needing but a few minutes' immersion in an alum solution to render it as permanent as the support which soon after receives it, offers a strong contrast to the troublesome, lengthy, and uncertain processes which are necessary to finish a silver picture.

Now to return to the plain bichromate prints. What is the oxide of which the image consists? and how is it converted into sesquioxide? It is chromium dioxide, and it is partly reduced to the lower sesquioxide when the other salts are washed out, and completely by the further action of the alum solution.

The decomposition which the bichromate has undergone may be thus represented:—

$$K_2Cr_2O_7 = K_2CrO_4 + CrO_2 + O$$

One equivalent of bichromate producing one equivalent of chromate, one of chromium dioxide and one of oxygen, the oxygen being probably taken up by the gelatine, rendering it insoluble.

Cold water does not, unless applied for a very long time, produce any appreciable change in this oxide, and can be used to dissolve out the bichromate and chromate which are associated with it, leaving the brown image intact.

In the experiments which I made, several such prints were washed with cold water till they afforded no precipitate with nitrate of silver, proving the absence of chromic acid or chromates. I then proceeded to ascertain if the brown body was really chromium dioxide, which I suspected to be its condition.

The first trial consisted in the application of hot water at about 160° Fah. In a short time the image began to assume a green colour, and the water a yellow tint. Nitrate of silver was added to this solution, with the unmistakable production of a precipitate of silver chromate. The reaction is:—

$$\underset{\text{Chromium dioxide.}}{3CrO_2} \quad + \quad \underset{\text{Water.}}{H_2O} \quad = \quad \underset{\text{Chromic acid.}}{H_2CrO_4} \quad + \quad \underset{\text{Chromium sesquioxide.}}{Cr_2O_3}$$

Three equivalents of the dioxide, when treated with plenty of hot water, giving one equivalent of chromic acid, which dissolves, and leaves an image of sesquioxide. This action is very slow, and, in practice, it cannot be assumed that all the image is thus changed. Other images were treated with a weak solution of caustic potash. The picture quickly turned green, and the solution, on being tested with a barium salt, gave a characteristic precipitate of barium chromate. The reaction is similar to the foregoing example, three equivalents of the dioxide and two of caustic potash giving one equivalent of water, one of potash chromate, and one of sesquioxide. A consideration of these results led me to question the generally-accepted assertion that alum, when applied to the image, simply indurates the gelatine, and removes a certain amount of chromium as chrome alum. That chrome alum is formed, I do not doubt, but, unless the exposure has been sufficiently long to reduce some of the chromium salt to a state of sesquioxide, this must, I conceive, be the result of a secondary, not of a primary, action. A batch of the brown prints were immersed in a saturated solution of alum; they soon began to change colour, and in about fifteen minutes the action was completed. The solution was certainly green, indicating the presence of a chromic salt, but on adding a solution of nitrate of silver to it a yellow precipitate was produced, indicating the presence of a salt of chromic acid; the reaction is most probably as follows:—

$$\underset{\substack{\text{Chromium}\\\text{dioxide.}}}{4CrO_2} \quad + \quad \underset{\substack{\text{Aluminium potassium sulphate}\\\text{(potash alum).}}}{2Al_2K_24SO_4} \quad + \quad \underset{\text{Water.}}{H_2O} = \underset{\substack{\text{Potassium}\\\text{chromo sulphate.}}}{K_4Cr_2O_7SO_4} +$$

$$\underset{\text{Aluminium sulphate.}}{2Al_23SO_4} \quad + \quad \underset{\text{Chromium sesquioxide.}}{Cr_2O_3} \quad + \quad \underset{\text{Sulphurous acid.}}{H_2SO_3}$$

The formula is not intended as an exact expression of what takes place; for instance, the aluminium is in it represented as existing as sulphate, though from the green colour of the solution it is pretty evident that a salt of chromium oxide is present. The known weak affinities of aluminium point to the conclusion that it is partially replaced by some of the sesquioxide of chromium; the decided weakness of the green image, when compared with one produced by the action of water, confirms this view.

If the alum solution, after use, be kept for a few days, it becomes much greener, probably owing to the formation of a salt of chromium oxide, the chromo-sulphate being de-oxidized by the sulphurous acid, forming a chrome alum.

The behaviour of these brown images where immersed in solutions of the alkaline sulphates appears to confirm the above deductions. The image gradually changes to green, but does not lose intensity, not being able to replace these stronger bases.

The reaction is very similar, giving a chromo-sulphate of the base used together with chromium sesquioxide and sulphurous acid; the solution after use gives with a silver salt a precipitate of silver chromate, and on standing for some time becomes green through the deoxidising action of the sulphurous acid. I refer to this property of the alkaline sulphates not for the purpose of suggesting their use in the place of alum, but to corroborate the opinions which I have advanced regarding the action of that agent on the chromium image.

The importance of thoroughly "aluming" chromotype prints cannot be too firmly impressed on the minds of workers by this process. Neglect on this point may endanger the tone of the print, by leaving in it a portion of chromium dioxide capable of yielding oxygen by the prolonged action of light.

I would suggest that a stronger solution of alum and a longer immersion in it than is ordinarily given is advisable. This would certainly do no harm, and would secure the most delicate tints from the possibility of oxidation.

And now this resumé of chemical characteristics of the two rival processes is finished. If no addition has been made to known facts, I have at least endeavoured to assist those who are debating the momentous question, "To be, or not to be, permanent?"

ECONOMICAL SILVER BATH FOR PRINTING PURPOSES.

BY M. D. RATTI.*

The paper which gives the best results is that which has not been salted, but only albumenized or slightly salted (two per 1,000) and albumenized. This paper is floated for two or three minutes in summer, and for four or five in winter, upon a bath made up of—

Distilled water	1,000 grammes
Nitrate of silver	40 ,,
Nitrate of ammonia ...	40 ,,
White sugar	40 ,,

After this bath has been used, it is put into a bottle together with ten grammes of animal charcoal, which is permitted to remain in the vessel.

In this way it may be preserved in a limpid condition without fear of the sugar reacting upon the nitrate of silver and reducing it. To maintain the bath at its proper strength of four per cent. it is necessary, after five sheets of paper have been sensitized, to add sixty grammes of a more concentrated bath, prepared of the undermentioned proportions:—

Distilled water	125 grammes
Nitrate of silver	12 ,,
Nitrate of ammonia ...	5 ,,
White sugar	5 ,,

The paper as it comes from the bath is suspended in the ordinary manner to dry, and further preserved in the dark in a suitable portfolio fitted with black paper. Before employment it is necessary to expose for some minutes to the fumes of ammonia, and then to wait until these have entirely dissipated, and the paper is perfectly dry. The prints, on their exit from the frame, are of a beautiful violet colour, and this tint they do not lose either in the toning or in the hyposulphite bath. The toning mixture I prefer is the following, the quantity here mentioned being sufficient to tone a sheet 45 by 54 centimetres, viz.:—

Ordinary water	250 grammes
Perchloride of gold	0·04 gramme
Crystallized acetate of neutral soda	3 grammes.

I leave this for about twenty-four hours in a warm locality, but if it is necessary that I should employ it at once, the liquid is warmed to about 90° Cent., and poured into a warmed porcelain dish, into which the prints are plunged after they have been washed two or three times in ordinary water. In a few minutes, according to the temperature of the bath, the toning solution will act. When the desired tone has been secured, and anything from a rose-purple to a violet-blue may be obtained, the operation is arrested, and the prints are transferred to a bath of ordinary water, which is changed at least once before the pictures go into the hyposulphite of soda solution, which is made up of ten per cent. strength.

A quarter of an hour in the fixing bath is sufficient. There only remains then to wash the prints, the water into which they are put being changed every quarter of an hour during two or three hours.

ACTION OF DYES ON THE SENSITIVENESS OF BROMIDE OF SILVER FOR THE NON-ACTINIC RAYS.

BY DR. H. VOGEL.

In some of my earlier communications on the above subject I have pointed out the reasons why different investigators who have repeated my experiments have not succeeded; they failed because they did not employ a true spectrum, because they took too much or too little dye, or gave a too short exposure.

Recently I have observed another reason of non-success, which I make known in the interest of others working in the same direction. I have always hitherto used bromide plates prepared in the silver bath, washed, and dried; but recently I tried the emulsion plates of Singer, already mentioned in this journal—plates with a slight excess of chloride of calcium.

The sensitiveness of these plates was nearly the same as that of my bath plates, and I expected a very good effect from them from my experiments with dyes. I was therefore very much surprised to find that these non-washed emulsion plates, coloured with solutions of naphthaline, red or cyanized, gave *not a trace* of action in the yellow or red on exposing them to the spectrum, whilst bath plates coloured in exactly the same way, gave action in the same time; for instance, yellow and red, stronger than the action in blue of the spectrum.

As I began my experiments with coloured plates, I used, at first, emulsion plates from Col. Stuart Wortley, *and with success*. The reason why I could not succeed with Singer emulsion plates may be, as I believe, the circumstance that Col. Wortley's emulsion has a slight excess of nitrate of silver, but the Singer emulsion a slight excess of chloride of calcium.

Correspondence.

ORNAMENTAL BORDERS FOR PORTRAITS.

Dear Sir,—In December of last year we submitted a few designs in negatives, which you were pleased to call "L'Entourage Artistique." It strikes me that the profession do not quite understand what a simple method they have at hand in this "Entourage" negative of making-money by turning a C.-D.-V. negative into a perfect cabinet picture—and, of course, charging cabinet price—without any trouble, or the slightest chance of spoiling even a single print in the transition.

We find in our own business that the "Entourage" negative supplies a want we had long felt in making a finished picture of a head or figure vignetted away from a group; or a single figure wanted to fill a cabinet space.

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* *Rivista Fotographica.*

The "Entourage" negative enables us to produce at will any number we may require.

In calling attention to this valuable and simple adjunct to the printing room, one need only say that the "Entourage" negative should be first printed, and then the vignette, or other picture, printed into the opaque space of the entourage, taking care that the vignetting glass covers entirely the entourage border. This is all the instruction needed; so that the merest tyro in the art of printing cannot possibly mistake.

I beg leave to send with this a negative of each size, so that you may be able to express your own valuable and practical opinion upon this subject.—Yours faithfully,

Sam. Glen Payne.

PERMANENCY IN CARBON PRINTING.

Sir,—I have read with much interest—and, I must confess, at times with much amusement—the recent correspondence on the subject of fading in silver prints. Permanency in photography is, I think, beyond cavil, the paramount question for photographers. When, little more than a quarter of a century ago, the new art became familiarized to the world as a practical fact, it was received with open arms, and hailed with delight alike by the man of science and the student of art. But when, after the lapse of a few short years, it was discovered that, like the phantoms rising from a witch caldron, they seemed designed to mock the beholder, to—

> Show his eyes and grieve his heart,
> Come like shadows, so depart,

the interest of the artist subsided, and the scientific man abated his respect. It is impossible to feel a deep interest in a statue carved in ice, how beautiful and artistic soever it may be. It is pretty and curious; but it posseses no permanent interest, because it will soon pass away.

A grand attempt has been made by a succession of energetic and enterprizing men to redeem photography by introducing prints which shall be permanent; substituting the most unchangeable substance, carbon, for the fleeting silver. The pioneers in such a work must struggle hard, expending time, money, and ability, reaping little fame and less profit. The successful workers of the accepted commercial photography look on with a pitying smile. But when the steady perseverance of the workers of the permanent method bring their results before the public in a commercial form, three remarkable results are produced amongst those having a vested interest in the established methods. First, they objurgate the new method and its advocates, blaspheming it by all their gods. Next, they exclaim the craft is in danger, and add a sentimental whine that the bread is about to be taken out of their children's mouths. And finally, they begin to enquire in earnest, Is it not possible to make our own method give stable pictures?

This is what they should have done much more earnestly many years ago. The enquiry has often been raised, but has never evoked more than a spasmodic, transient interest. I believe, judging from my own experience, that silver prints may be made much more permanent than the majority of those which are produced. But I wish to ask you seriously, sir, if the time for that enquiry has not gone by? Why should we endeavour to tinker a process which, although beautiful, has within itself the scrofulous consumptive taint which is constantly liable to break out, and leave the most beautiful print fading away? The process has done good service: let it retire with honours. Rather let the enquiry now be: How shall we conserve the permanency which carbon undoubtedly offers us, from the risks with which cupidity, carelessness, and ignorance surround the greatest and best discoveries?

Carbon printing, or the means of carbon printing, by a natural and legitimate aggregation, has become a huge monopoly. This monopoly is in many aspects a beneficial thing; but it may be either beneficial or mischievous. Happily it seems, from general report, that the monopoly has fallen into good hands, and is likely to be beneficial. But there are certain points upon which, for the reputation of the new photography, those who produce their portraits upon it should be well assured. They produce, as they must do, their work upon tissue supplied to them. They must purchase their tissues in faith. They have no means of knowing that absolutely permanent pigments are used. Does the carbon print with the rosy bloom about the blacks, which rivals the gold tone of the finest silver print, owe its seductive charm to carmine fair, but false and fugitive? Are the reticulations and other faults in some carbon prints all due to inefficient operating in inexperienced hands, or to variations and shortcomings in the quality of the tissue? These and some similar points in relation to carbon printing are, if you will permit me to suggest it, of more importance in this era of photography than any which can now arise as to the means of bolstering up for a little time longer our old friend and servant, silver printing.

The admirable series of articles by Mr. Howard, which have lately appeared in your pages, have suggested to me a question which, through your pages, and on behalf of photographers, I should like to ask the Autotype Company. Would it not be possible, and, if possible, desirable, to supply photographers with tissue (in paying quantity, of course) prepared to their own tint, and with pigments indicated by the photographer, so that he should know the materials with which his work is produced, and the sources of his reliance for permanency?

Apologizing for so far trespassing on your space, I am, sir, respectfully yours, A Carbon Amateur.

REPRODUCING STAINED WINDOWS IN MINIATURE.

Dear Sir,—The reproduction of brasses and monuments in churches is a favourite pastime with many, and now that church windows may also be reproduced with but little trouble, it is possible that such work may have attractions for amateur photographers.

A little while ago, my assistance was asked to secure a photograph of a memorial window erected in memory of a deceased officer, and I at once saw how readily a miniature reproduction of the same might be made by means of the carbon process. Without any colouring at all, a very satisfactory result was obtained by simply printing a transparency on matt glass; but by developing a deeply-printed image upon plain glass, and affixing to the back of the plate a sheet of transparent tracing paper to receive the colours, a very good imitation of the original window, in all its tints, was secured without much trouble. The outlines and shadows being given by the photographic film, it is only necessary to apply the brightest colours one can find to the paper backing, being guided by the transparency; and when the window is afterwards regarded from the front, the effect is very much the same as that of glass staining, the colours standing back, as it were, as in the case of the windows themselves.

This little application of the carbon process may be of use to some of your readers.—Faithfully yours,

H. Baden Pritchard.

General Photographic Establishment of the War Department, Woolwich, April 24.

SUBSTITUTE FOR GROUND GLASS.

Sir,—Thanking Mr. Gardner for his courteous explanation, I think I may say that his experiments do not entirely upset either my suggestion or objections. These latter were based upon the fact that my thermometer has frequently stood at upwards of 120 deg. when exposed to the full power of a summer sun; and that many substances, such as glass and metals, under the same circumstances, will attain a heat sufficient to scald the hand. This his experiments did not reach, but his proposed substitute for ground glass will no doubt answer. I think that all field cameras should have the ground glass panel so arranged as not to need removal, but be capable of being pushed back when the dark slide is inserted, springing back to its former position when the latter is again removed; thus it would be always in the shade, and not be so liable to accidents. As regards my suggestion, Mr. Gardner's white hard varnish no doubt contained a considerable quantity of mucilaginous gum, which, on the addition of water, caused it to become ropey, and totally unfit for such a purpose. The best for that, also for negative lantern slides and most other photographic purposes that I know of, and which I have made a practice of using for many years, is simply a solution of the best orange-coloured shellac in methylated spirits, about three ounces to a pint—slightly bruised; it must be shaken frequently until the gum is dissolved; then let it stand some time to settle; use as customary. When made with a greater proportion of shellac it becomes excellent French polish. Mr. Gardner's process for obtaining a matt surface on varnish (substituting gum mastic for resin) is exactly similar to one of those used for removing dirty varnish from the surface of oil paintings.—I am, dear sir, yours truly,

April 25th. James Martin.

Proceedings of Societies.

Manchester Photographic Society.

The monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 13th instant, Mr. G. T. Lund occupying the chair.

After the minutes of the previous meeting were read and confirmed,

Mr. John Brier, jun., read a paper on "A Quick Dry Process without Blisters" (see page 194).

Mr. Brier exhibited several excellent negatives by his process; also the racks and backing-stand used by himself in the practice of the process.

There was no other business before the meeting, and no discussion took place on the paper. As usual when a meeting has fallen on the eve of Good Friday, everybody seemed anxious to get away.

A vote of thanks was passed to Mr. Brier for his paper, and the meeting adjourned.

Liverpool Amateur Photographic Association.

The ordinary monthly meeting of this Association was held on Tuesday evening, the 25th instant, at the Free Public Library and Museum,—Mr. W. Atkins, President, in the chair.

The minutes of the previous meeting were read and confirmed.

The Rev. H. J. Palmer exhibited some gelatino-beer negatives which he had taken taken during a trip into Yorkshire. With thirty-six plates he had returned with thirty-six negatives. These, however, were from plates prepared a short time before starting. Some plates prepared with beer, made a few months ago, were all failures, owing to a kind of fungus which seemed to have broken out all over the plates, completely spoiling them. This was owing, he believed, to damp getting to his plates, steam having had access to the room in which they were kept in deal boxes.

The President stated that he lost some plates which had been kept in a deal box.

It was remarked that Mr. Kennett had pointed out the danger of keeping plates in such boxes, recommending mahogany instead, as turpentine in the pine wood had the effect of destroying the sensitiveness of the gelatine plates.

Mr. P. Mawdsley said that he had no doubt the exhalations from the deal plate boxes would have a bad effect on any sensitive plate, especially if the wood were new.

The Rev. H. J. Palmer found that the plates prepared with water alone added to the pellicle had not deteriorated at all, although he had had them more than a year in the boxes. It was, therefore, probable that those prepared with beer absorbed the moisture more readily, and the sugar in the beer had been the cause of their spoiling.

Mr. L. W. Weber handed round some negatives which he had made with half beer and half water to dissolve the gelatine pellicle. These were exceedingly satisfactory, and had not shown any signs of deterioration.

Mr. W. B. Roberts showed some negatives made according to the formula recommended by Mr. Kennett, namely, one teaspoonful of mild ale, and two drops of a twenty-grain solution of bromide of cadmium to the ounce of emulsion. This required an increase of the exposure to about one-sixth, and density could readily be obtained.

Mr. Palmer said that the addition of bromide of ammonium was also good instead of the cadmium.

The general opinion was, however, that all these additions only lessened the sensitiveness of the plates, and that the addition of a small quantity of beer would be all that was required.

A discussion ensued as to the necessity of backing these plates.

Mr. Palmer and the Secretary stated that for interiors it certainly was necessary.

Mr. P. Mawdsley said that for ordinary landscape work, plates prepared with the Liverpool emulsion did not require backing, but for subjects presenting very strong contrasts and requiring long exposures it was necessary to back. He (Mr. Mawdsley) exhibited two prints of the same interior—one from a plate backed, the other from one that was not. The difference in favour of the backed plate was most decided.

Negatives and prints were exhibited by Mr. J. A. Forrest, Mr. W. H. Kirkby, and others, and Mr. J. H. T. Ellerbeck showed some beautiful lantern slides of insects and leaves.

The President announced that there would be an excursion to Frodsham on Saturday, the 6th of May.

The Rev. H. J. Palmer said that he would be prepared to take a group of the members at the commencement of the next evening meeting.

The meeting was shortly afterwards adjourned.

French Photographic Society.

A meeting of this Society was held on the 3rd ult., M. Peligot in the chair.

M. Sahler, civil engineer of Montbéliard, sent a communication upon instantaneous wet plate photography. It was referred to the Committee.

General Morin invited the Society to contribute to the Scientific International Exhibition to be held at South Kensington. A favourable answer was given to the invitation.

M. Lacan exhibited a collection of pictures taken in India, by Captain Waterhouse, interesting not only by reason of the subjects chosen, but because of their high perfection.

M. Lacan also exhibited some crystal vases ornamented by photography, produced by M. Truan, of Gijon, in Spain.

M. Ravet, of Surgeres, forwarded some micro-photographic enlargements of the Phylloxera, or vine-destroying insect, which caused so much trouble in France. The enlargements were from 100 to 550 diameters.

M. Perrot de Chaumeux, in giving some extracts from foreign journals, mentioned a cement for wood as well as glass and porcelain, consisting of a one per cent. aqueous solution of sulphate of alumina added to a thick gum solution.

M. Peligot had often used this gum, and added a little carbolic acid to prevent its decomposition.

M. Geymet exhibited some prints produced in fatty ink.

M. Mouilleron, in the name of M. Braun, of Dornach, exhibited a numerous collection of carbon prints representing reproductions of pictures in the Hague Museum; the carbon prints had been produced by the Swan process.

M. Georges Fortier presented a copy of his new work, *La Photo-lithographie, son Origin, ses Procedes, et ses Applications.*

M. Roger exhibited a new camera for travellers, and a stand for cleaning plates.

M. Fortier gave a demonstration of the photo-lithographic process.

The proceedings then terminated.

Talk in the Studio.

A Large Group.—Mr. Cooper, of Hull, has recently exhibited at the rooms of the Autotype Company a large combination group printed in carbon. It represents the Holderness Hunt, and contains fourteen figures on horseback, together with a pack of hounds, earth stopper, with other adjuncts and characteristic scenery. The picture measures six feet by four, and is a great success.

Syphons for Emptying Baths.—Mr. W. H. Wheeler writes:—"I notice another allusion to syphons by a correspondent. In emptying a vertical bath for thirty by twenty-five plates, I use a simple loose tube of gutta-percha some five or six feet long, and immersing all but the upper four or five inches; I then place my finger tightly on the upper end (or cork it), and upon drawing out the tube until the upper end can be depressed to more than the four or five inches below the level of the bath, the syphon will act on removing the finger or cork. The reason is sufficiently obvious; but the application is so simple, easy, and clean, that the suggestion may, I venture to think, be useful to some one."

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To Correspondents

Citric.—The best mode of securing colour used in spotting out from being disturbed on applying the enamel surface is to mix it for application with some medium which becomes insoluble when once dry. You may make such a medium by mixing a saturated solution of borax with lac varnish; or you may buy something of the kind ready for use. Newman's medium will answer. 2. An acetate toning bath is not, as a rule, intended to be neutralized, and, if neutral when made, it will not be so at the end of two or three days. But if you wish, you may neutralize it with chalk. 3. The surfaces of dry plates are better kept from contact with anything in packing. Bands of unvulcanized india-rubber placed round the end of a plate will permit another to be placed upon it without touching. A number may be packed in this way.

J. T.—It is probable from your description that the addition of a little nitric acid would make your bath all right. Failing this, neutralize by the addition of a few drops of a 10-grain solution of carbonate of soda, pour into a flat dish, and sun very thoroughly; filter, and try, or add nitric acid before trying, as a freely acid bath is best for collodion positives. The streaks you describe are probably due to scum floating on the solution. Take strips of clean blotting-paper, and draw over the surface.

W. J. A. G.—Our advice would be to try the processes and modes of working with which you are most familiar, and of which you are most master. If you have time to experiment a little with the alkaline bath before starting, it may be well to be provided with facilities for its use in the higher latitudes; but we should avoid experimental operations as much as possible when actual work has to be done. So in like manner with the collodion: it may be wise to be provided with some simply iodized collodion as a possible resource, but we should rely upon a good bromo-iodized sample. Bear in mind that with simply iodized collodion and iron development it is difficult to work with perfect cleanliness. You have done wisely, doubtless, regarding the lenses.

H. Spink.—It is probable that fusing the crystals will prove a remedy.

J. K.—The increase of thickness necessarily present in large lenses does, in a slight degree, interfere with rapidity, so that a large lens with the same ratio of focus and aperture as a small lens will not be quite so quick. We cannot state the precise proportions, as they will differ with varying circumstances, such as form of lens, colour of glass, &c.

W. P. D.—We have published many methods of photographing on wood for engraving. One of the best consists in producing a photo-lithographic transfer, and transferring it to the surface of the wood, in the same way as it would be transferred to stone. You will find a good and simple article on photo-lithography in our Year-Book for 1867. Or you may get the transfer by a photo-collographic process, details of which you will find in our Year-Book for 1871.

G. Mancer.—The use of opal glass behind the transparency is for the purpose of diffusing direct sunlight, and it is not needed with diffused light. 2. The developer should always depend upon the general formulæ. On this point you will find good information, with details, in the little pamphlet issued by Mr. Solomon, entitled "Photography in Four Lessons" 3. Not much: it acts slightly as a retarder. 4. Use the preparation recommended by Mr. Sawyer. We do not know the prices charged.

G. C. asks "how to make a solution for the Daguerreotype process"? The question is curiously vague and puzzling. The only solutions usually used in the Daguerreotype process are a solution of hyposulphite of soda and a solution of hyposulphite of gold; both these being used in fixing the picture already produced. In the Daguerreotype process a polished surface of silver is submitted first to the fumes of iodine, then to the fumes of bromine; next exposed in the camera, and afterwards developed by exposure to the fumes of mercury. It is then fixed in the hypo solution, and gilded with the gold solution.

Observer.—The card you enclose is toned very well, and is very creditable work for the appliances used. A cheap quarter-plate lens will answer your purpose as a beginner. Consult our advertising pages, and write to one or two dealers for particulars.

C. Smith.—The reticulation of your collodion film is due to the presence of too much water in the collodion; that is, the ether and alcohol were insufficiently rectified. 2. Yes, pretty good.

Sanger.—We should have thought that the line of light in contact with the hat was in the negative. That on the cheek appears to be the result of imperfect contact between the carbon and film and the mounting paper, caused by the thickness of the carbon and gelatine forming the black fur.

W. H. Wheeler.—We have an impression that it is in the Philosophical Transactions, but are uncertain as to volume. Have you read the paper of Mr. Dallmeyer on the subject, read before the Photographic Society, in which the theory was endorsed by Sir John Herschel? Thanks.

An Amateur.—As the pressure upon our time does not leaves us leisure to verify such matters, we submitted your letter to the author, who says:—"Your correspondent should have multiplied 23·3 grains of Ag Cl by 1·18, as given for fused or recrystallized $AgNO_3$, which has no H_2O or nitric acid adhering to it, and he will get 27·494 grains of $AgNO_3$, which is as near as most photographers can weigh. The 1·29 refers to ordinary commercial crystals, which, I am glad to find, has improved much since I made the note (about five years ago) of the amount of adhering water and HNO_3 present. Your correspondent tried the permanganate test for the water, and the silver test for his print. *Verb sap.*

Amateur No. 2.—Mr. Skaife many years ago invented a small very rapid lens and camera, which gave an image during the second or two of illumination caused by firing a pyrotechnic powder which gave a light of great brilliancy. We do not know whether it is manufactured and sold at present or not.

Thomas Sims.—Thanks. We shall have pleasure in receiving your views on the matter for publication.

A. Brothers.—Thanks.

C. J. Fairlie.—Thanks. In our next.

Goosequill.—In our next.

Several correspondents in our next.

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METEOROLOGICAL REPORT FOR MARCH.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven, 36 feet above sea-level.

Date.	Barometric Pressure. Morning	Barometric Pressure. Noon.	Barometric Pressure. Night.	Temperature. Morning	Temperature. Noon.	Temperature. Night.	Direction of Wind at 9 a.m.	REMARKS.
1	29·20	29·18	29·23	48°	50°	44°	S.	Rain a.m. and at night
2	29·30	29·32	29·32	41	49	46	S.	Rain this morning and evening
3	29·20	29·17	29·12	50	54	48	S.W.	Rain a.m. with strong wind
4	29·20	29·25	29·31	43	47	46	S.S.W.	Fair, but gloomy. Windy
5	29·33	29·29	29·20	41·5	45	50	S.	A little rain morn. & afternoon
6	29·10	29·20	29·25	43	46	43	W.	Showers a.m. and p.m.
7	29 20	29·40	29·45	36	43	42	S.W.	Showers of hail, with wind, a.m.
8	29 29	29·00	28·48	44	46	40	S.W.	Rain a.m. and p.m.
9	28 40	28·30	28·24	38	41	41	W.	Showers a.m. and p.m.
10	28·23	28·20	28·30	37	41	39	S.W.	Rain a.m. and p.m.
11	28·50	28·60	28·62	39	41	35	S.W.	Rain this afternoon
12	28·62	28·63	28·97	38	42	36	W.	Rain a.m. and p.m.
13	29·10	29·18	29·00	30	41	40	W.	Fair, but gloomy
14	29·00	29·06	28·90	46	51	48	N.W.	Rain this morning & afternoon
15	28·70	28·71	28·94	41	43	38	W.	Showers a.m. and p.m. Windy
16	29·10	29·18	29·25	36	40	35	W.	Showers of snow this afternoon
17	29·21	29·31	29·50	37	39	33	N.W.	Fair, generally sunny
18	29·60	29·70	29·80	34	39	28	N.W.	Fair, generally sunny
19	29 79	29·75	29·70	32	39	29·5	N.	Fair, but gloomy
20	29·58	29·50	29·57	26·5	37	32	N.W.	Fair, but gloomy
21	29·60	29 68	29 70	31	36	32	W.N.W.	A little rain a.m.
22	29·73	29·73	29·69	31	40	31	W.	Fair and sunny
23	29·57	29·53	29 40	39	41	40	N.W.	Fair, generally gloomy
24	29·30	29·22	29·21	39	46	39	W.	Fair, but gloomy
25	29·31	29·44	29·48	36	40	38	W.	Fair and sunny
26	—	29·30	29·23	39	40	37	S.W.	A little rain this afternoon
27	29·20	29·13	29 10	36	41	38·5	S.W.	Fair and sunny
28	28·89	28·89	28·90	39	44	42	S.	Fair, but gloomy
29	28·93	29·87	29·10	44	50	44	S.	Rain this afternoon
30	29·15	29·20	29·30	46	49	47	S.W.	Rain a.m. and p.m.
31	29·31	29·31	29 29	46	51	46	S.S.W.	Rain a.m. and p.m.

Summary.

	Mornings.	Noons.	Nights.
Maximum temperature	50° ...	54° ...	50°
Minimum ditto	26·5 ...	36 ...	29·5
Mean ditto	39 ...	43·6 ...	39·9

Mean of all observations ... ... 40·8+

Number of days on which rain fell	16
Number of fair days	12
Fair days, gloomy	7
Fair days, bright	5

Notes.—By referring to the foregoing table it will be seen that there has been a considerable change in the temperature and barometric pressure during the month. The lowest temperature noticed in the mornings was 26·5°, whilst the highest was 50°, a difference of 23·5°. On the 9th, 10th, and 11th, the barometer stood very low, the lowest on the 10th, when it registered only 28·20 at noon.

The Photographic News, May 5, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Photographs of Old London—Pictures of Thebes—A Substitute for Litmus—Producing Designs on Glass.

Photographs of Old London.—Several times have we advocated in these columns the policy of securing pictures of Old London, by means of the camera, and we have pointed out localities, fading away with time, of which photographic records ought to be secured without delay. We want photographers to do with the camera what such men as Walter Thornbury and Thomas Archer have done with the pen, to give us picturesque sketches of the London that existed two or three centuries ago, and of which there are links still remaining in some of our older streets and ancient courtyards. We are glad to see that at last an effort is to be made to do this, and, according to the *Athenæum*, a Society has been formed to carry on the work effectually. Relics of Old London that still exist, and which lend themselves to the photographer's art, are to be reproduced forthwith, and, as a preliminary, some pictures of the Old Oxford Arms, in Warwick Lane, in the City, have already been secured. Mr. Alfred Marks, of Long Ditton, is the executive officer of the Society, and some of the next pictures to be taken will be views of the old houses in Wych Street, Strand, which many of our readers will know; some parts of Drury Lane, the Lincoln's Inn Gateway, and the old chambers in the same Inn, will furnish further subjects. If the Society is well supported, we may hope ere long to see a whole series of picturesque views of Old London produced, such as could not fail to be attractive to a large number of those who were born within reach of Bow Bells.

Pictures of Thebes.—Captain Abney is about to publish, through the medium of Sampson Low, Son, and Marston, a series of photographs of the temples of Thebes, secured by him during the time of his sojourn at that interesting spot, when stationed to observe the transit of Venus. The pictures are to be printed by the Woodbury Photo-relief process, and may therefore be regarded as permanent, while the letterpress will be from the pen of Captain Abney also. No doubt a handsome and interesting volume will be the result, for which there should be a sale both in this country and abroad, if the price asked for it is not too high.

A Substitute for Litmus.—We are promised a more delicate test than litmus, by the *Gazetta Chimica Italiana*, in the forming of a blue colour called phyllocyanin. This material is most delicately sensitive, and for this reason will recommend itself to chemists as a valuable test for alkalies. We fear, however, that the new pigment will be of an expensive character, seeing that the sources where it is obtainable are very limited. Phyllocyanin is, indeed, nothing less than the blue principle of the fragrant violet and the blue iris, and it is from these flowers that the colour is obtained. In the *Italian Chemical Gazette* there is a paper on the preparation of this fine and delicate blue, communicated by Signor Guido Pellagri, who has made an investigation of the properties and character of the new colouring matter, and he it is who believes that chemists will be glad to welcome phyllocyanin as one of the most exquisite tests for alkaline reactions. In Italy and in the South of France, where most of our perfumes come from, and where extensive gardens are laid out for the cultivation of flowers for the supply of essences to perfumers, no doubt a supply of these blossoms might not be difficult to obtain. Indeed, as the violets which are robbed of their perfume are not injured beyond placing them in grease, which absorbs the odours, these might probably be utilised afterwards for the extraction of phyllocyanin.

Producing Designs on Glass.—The etching of photographs upon glass is a process little practised by photographers, and yet some pretty applications may be made by ornamenting globes, vases, and drinking glasses in this manner. It is true some glass is better adapted for the purpose than others, and that which contains a good deal of lead is said to be the most suitable. Any photographic film is sufficiently thick for protecting the glass where the etching liquid is not to act, and designs or pictures may therefore easily be formed capable of resisting the action of hydrofluoric acid, which dissolves the rest of the surface. Extreme care must be taken in handling this acid, however; it must be kept in gutta-percha utensils, for, naturally enough, it will dissolve any vessel made of glass. Care should be taken also to prevent it touching the fingers, as it renders the hands very painful wherever it comes in contact with the flesh. Glass which is faced with a surface of colour or opal may be worked with great ease, and the acid coming in contact with the unprotected surface dissolves away the facing, and leaves either a design in transparent glass, or one in colour, according as a negative or positive has been made use of to produce the mask upon the glass. A dilute acid is employed for etching in preference to a strong one, and the time that is required to dissolve away the surface depends in great measure upon the character of the glass itself. A carbon film will suit very well as a mask, and in this case it is well to apply the moist solarised tissue to the glass surface, and develop the image upon the glass. The image, under these circumstances, holds very tenaciously to the glass surface (which has not been waxed, it must be remembered), and, when dry, the glass object is transferred to the etching bath, where, if it happens to be a lamp globe, it is kept slowly revolving. The etching bath is made of gutta-percha, or wood protected with sheet lead, and the object remains herein until the etching has proceeded far enough. When this is the case, the glass is withdrawn, washed, and then the carbon or other image removed in any ready manner that may suggest itself. In the case of designs or lithographs which it is desired to etch upon glass, a special ink is employed, which is applied to the surfaces to be protected from the action of the acid. This ink is a thick solution of asphalte in turpentine, thickened by means of bees' wax and resin. In this case, as also in the case of photographs to be reproduced in ground glass or colours, it is necessary that the glass surface to be etched should, in the first place, be of ground glass or faced with coloured glass, blue, red, green, violet, &c., according to desire. The lithographic ink or photographic film forming the design then protects the coloured or ground glass, and the rest of the surface being washed away until the transparent glass underneath comes into view, there results a coloured or ground glass design upon transparent glass.

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THE MECHANICAL ACTION OF LIGHT.

BY WILLIAM CROOKES, F.R.S., ETC.

[We have been favoured by Mr. Crookes with the following abstract of Part IV. of his paper on this subject, from the "Proceedings of the Royal Society." The details will be full of interest to our readers.]

In this paper the author describes experiments on the repulsion produced by the different rays of the solar spectrum. The apparatus employed is the horizontal beam suspended by a glass fibre, and having square pieces of pith at each end coated with lampblack. The whole is fitted up and hermetically sealed in glass, and connected with an improved mercury pump. In front of the square of pith at one end a quartz window is cemented to the apparatus; and the movements of the beam, when radiation falls on the pith, are observed by a reflected ray of light on a millimetre scale. The apparatus was fitted up in a room specially devoted to it, and was protected on all sides, except where the rays of light had to pass, with cotton wool and large bottles of water. A heliostat reflected in a constant direction a beam of sunlight, which was received on an appropriate arrangement of slit, lenses, and prisms for projecting a pure spectrum. Results were obtained in the months of July, August, and September; and they are given in the paper graphically as a curve, the maximum being in the ultra-red, and the minimum in the ultra-violet. Taking the maximum at 100, the following are the mechanical values of the different colours of the spectrum:—

Ultra-red	100
Extreme red	85
Red	73
Orange	66
Yellow	57
Green	41
Blue	22
Indigo	8½
Violet	6
Ultra-violet	5

A comparison of these figures with those usually given in text-books to represent the distribution of heat in the spectrum, is a sufficient proof that the mechanical action of radiation is as much a function of the luminous rays as it is of the dark heat rays.

The author discusses the question, "Is the effect due to heat, or to light?" There is no real difference between heat and light—all we can take account of is difference of wave-length—and a ray of a definite refrangibility cannot be split up into two rays; one being heat, and one light. Take, for instance, a ray of definite refrangibility in the red. Falling on a thermometer, it shows the action of heat—on a thermopile it produces an electric current—to the eye it appears as light and colour—on a photographic plate it causes chemical action—and on the suspended pith it causes motion. But all these actions are inseparable attributes of the ray of that particular wave-length, and are not evidence of separate identities.

The author enters into some theoretical explanations of the action of the different parts of the spectrum, but these cannot well be given in abstract.

An experiment is described by which sunlight was filtered through alum, glass, and water screens, so as to cut off the whole of the ultra red or dark heat rays. The ray of light which was thus freed from dark heat was allowed to fall on the pith surface of the torsion apparatus, when it produced a deflection of 105°. On interposing a solution of iodine in disulphide of carbon the deflection fell to 2°, showing that the previous action was almost entirely due to light. With a candle tried under the same circumstances, the light filtered from dark heat produced a deflection of 37°, which was reduced to 5° by interposing the opaque solution of iodine.

In order to obtain comparative results among discs of pith coated with lampblack and with other substances, a torsion apparatus was constructed in which two or more discs could be exposed one after the other to a standard light. One disc always being lamplacked pith, the other discs could be changed so as to get comparisons of action. If the action of radiation from a candle on the lampblacked disc be taken as 100, the following are the proportions obtained:—

On lampblacked pith	100
On iodide of palladium	87·3
On precipitated silver	56
On amorphous phosphorus	40
On sulphate of baryta	37
On milk of sulphur	31
On red oxide of iron	28
On scarlet iodide of mercury and copper	22
On lampblacked silver	18
On white pith	18
On carbonate of lead	13
On rock salt	6·5
On glass	6·5

In consequence of some experiments tried by Professor Tait and Dewar, and published in *Nature*, July 15th, 1875, the author fitted up a very sensitive apparatus for the purpose of carefully examining the action of radiation on alum, rock salt, and glass. The source of radiation was a candle. Perfectly transparent and highly polished plates of the same size were used, and the deflection was made evident by an index ray of light. Taking the action on the alum at 100, that on the rock salt in five successive experiments was 81, 77·3, 71, 62·5, and 60·4. This increasing action on the alum was found to be caused by efflorescence, which took place rapidly in the vacuum, and rendered the crystal partially opaque. A fresh alum plate being taken, this and the rock salt were coated with lampblack and replaced in the apparatus, the black side away from the source of radiation, so that the radiation would pass through the crystal before reaching the lampblack. The action of radiation was in the proportion of blacked alum 100 to blacked rock-salt 73.

Rock-salt and glass were next tested against each other *in vacuo* in a torsion-balance. Professors Dewar and Tait say that rock-salt is inactive when the beam from a candle is thrown on it, while a glass disc is active. The author has failed to corroborate these results; he found the mean of several concordant observations to be—rock-salt 39, glass 40.

THE MEASUREMENT OF THE FORCE.

The author describes a torsion-balance in which he is enabled to weigh the force of radiation from a candle, and give it in decimals of a grain. The principle of the instrument is that of W. Ritchie's torsion-balance, described in the Philosophical Transactions for 1830. The construction is somewhat complicated, and cannot be well described without reference to the diagrams which accompany the original paper. A light beam, having two square inches of pith at one end, is balanced on a very fine fibre of glass stretched horizontally in a tube, one end of the fibre being connected with a torsion-handle passing through the tube, and indicating angular movements on a graduated circle. The beam is cemented to the torsion-fibre, and the whole is enclosed in glass and connected with the mercury-pump and exhausted as perfectly as possible. A weight of 0·01 grain is so arranged that it can be placed on the pith, or removed from it at pleasure. A ray of light from a lamp reflected from a mirror in the centre of the beam to a millimetre scale 4 feet off shows the slightest movement. When the reflected ray points to zero, a turn of the torsion-handle in one or the other direction will raise or depress the pith end of the beam, and thus cause the index ray to travel along the scale to the right or to the left. If a small weight is placed on one end so as to depress it, and the torsion-handle is then turned, the tendency of the glass fibre to untwist itself will ultimately balance the downward pressure of the weight, and will again bring the index ray to zero. It was found that when the weight of the $\frac{1}{10}$ of a grain was placed on the pith surface, the torsion-handle had to be turned 27 revolutions, and 353°, or 10,073°, before the beam became horizontal. The downward pressure of the $\frac{1}{100}$ of a grain was therefore equivalent to the force of torsion of the glass thread when twisted through 10,073°.

The author next ascertained what was the smallest amount of weight which the balance would indicate. He found that 1° of torsion gave a very decided movement of the index ray of light, a torsion of 10,073° balancing the $\frac{1}{100}$ of a grain, while 10,074° overbalanced it. The balance will therefore turn to the $\frac{99}{100000000}$ of a grain.

Divide a grain weight into a million parts, place one of them on the pan of the balance, and the beam will be instantly depressed.

Weighed in this balance the mechanical force of a candle twelve inches off was found to be 0·000444 grain; of a candle six inches off, 0·001772 grain. At half the distance the weight of radiation should be four times, or 0·001776 grain; the difference between theory and experiment being only four-millionths of a grain is a sufficient proof that the indications of this instrument, like those of the apparatus previously described by the author, follow rigidly the law of inverse squares. An examination of the differences between the separate observations and the mean shows that the author's estimate of the sensitiveness of his balance is not excessive, and that in practice it will safely indicate the millionth of a grain.

One observation of the weight of sunlight is given; it was taken on December 13; but the sun was so obscured by thin clouds and haze that it was only equal to 10·2 candles six inches off. Calculating from this datum, it is seen that the pressure of sunshine is 2·3 tons per square mile.

The author promises further observations with this instrument, not only in photometry, and in the repulsion caused by radiation, but in other branches of science in which the possession of a balance of such incredible delicacy is likely to furnish valuable results.

MY PORTRAIT.*

Strange to say, until last week I never entered a photographer's studio—I never had my portrait taken. But the importunity of friends—and whereas in old days one's friend was always asking the loan of your horse, your modern is always eager for your carte—and the wish of the wife of my bosom prevailed, and I resolved to sit. My wife's emphatic words were:

"Mind you smile, dear!"

For hours, for days, for weeks I smiled before I could satisfy myself sufficiently to smile at the photographer. Wherever there was a mirror I smiled. At refreshment bars, at railway waiting rooms, at cafés, at looking-glass makers, I grinned, and sometimes with remarkable results. A golden-haired barmaid at Spiers and Pond's thought I smiled on the pro-rata principle, and returned my smile with interest. She was an interesting young lady, and if——But this is weakness. I proceed.

Having selected a photographer's, I entered his studio—very much out of breath from climbing eight flights of stairs—and suggested, with *the* smile, that I wished to be taken.

"Half length?"

"Oh! go to any length you please if you catch the right expression," I responded.

"But the figure?"

"I don't mind the figure." Thinking he referred—people are so slangy now-a-days—to the price.

"In that case perhaps a vignette will be best."

I wonder how Charles I. felt when they brought him out in front of Whitehall to take off his head? Very much, I fancy, as I did when the photographer proceeded to take off my head.

"Kindly take a chair, sir, and place your head against this bar."

I did so.

"Thanks, that will do. You are pretty well posed."

In fact I felt I should be posed completely if kept long in that position.

But the smile! I had almost forgotten it. I drew it out and put it on.

"Don't move, sir."

But there was a a fly who had an evident desire for his likeness, with my nose for a background. Piff! paff! got rid of him at last.

"All ready, sir? Smile!"

The man must have penetrated my secret thoughts, or how could he have guessed what had occupied my mind for weeks? But I smiled. I had not forgotten my wife's admonition. I fancied there was a much broader smile on the face of the operator than upon mine.

"What's the matter?" I asked.

"Notning, sir; but I fear with that expression you wouldn't like the portraits."

I get the right smile at last.

Silence. "The beating of my own heart was the only sound I heard," as the song says. Click! It is done.

"Thank you, sir."

I wait. I relax my features from the stony tyranny of "the smile." I feel better—almost hopeful, in fact. There is a mysterious sound of rinsing somewhere in the dark. Then the operator comes from his secret cave.

It is all smile! My mouth has run into my ears—my eyebrows are in my hair—I am grinning all down my back. I remonstrate.

"Well, please sit again," says the operator, sulkily.

I sat; but—I had forgotten the smile! and he did not remind me of it.

"'Twill be all right," said he—"all right!"

When I received the copies, there were deep wrinkles over the brows; eyes almost hidden by a tremendous scowl; hair touzled; mouth drawn down—I was a horror. Worse: I was an object of scorn to the wife of my bosom, who had said, "Mind you smile, dear!"

Sternly and resolutely I refused to pay the photographer's demand. He threatened—I was firm. He appealed—I was adamant. Baffled, but not resourceless, he retired. And next day, as I passed his studio, I beheld in the case of portraits at the door, exposed to the gaze of vociferous neighbours, a copy of that first portrait with the smile—the portrait of an idiot.

THE DARK ROOM.

BY JAMES MARTIN.

It may be said that the most material points for consideration concerning the interior points of a dark room are its fittings—of what they should be made, their various purposes, and their arrangements. Much will depend upon the situation and size of the building, and the general style of business. However, it may be safely urged that they should be simple, and in no greater quantity than absolutely required for the convenient performance of the operation intended to be carried on. No opportunity should be given for the storing away of useless lumber. The shelves should be of unpainted wood, and those which are appropriated to glass measures and bottles should have a light rim round them. This also should be the case with what may be called the work-bench, thus forming a shallow tray, on which, should any nitrate bath unfortunately be spilled, it can easily be collected, and its valuable material saved from being lost. Over part of the bench it will be well to have a shelf perforated at its most convenient end by two or three circular holes. If this is placed at a proper height it will serve as a funnel-stand, and be found very convenient and safe for storing funnels and filtering liquids when required.

The next—and perhaps most conducive to convenience, good work, and the health of the operator—is the sink, its situation, shape, and the materials of which it is made. It should be placed lengthways, directly under the window which gives light to the operator, so that he may stand facing it. I have seen many, but none are in my opinion superior or even equal to the one I am about to describe, and I speak from an experience of upwards of twenty years.

The sink that I have used is made of well-seasoned and perfectly sound deal board of one inch thickness, its joints grooved, and put together exactly in the same manner as a washerwoman's washing-tray. It need not be of greater depth than six or eight inches. Both its ends should be left so extended as for each to form a commodious shelf or table; that on the right hand will serve upon which to place developers, fixing solutions, &c.; on the left hand one may be placed a developing-stand for the purpose of relieving the operator's hand from the unfinished plate whilst mixing the intensifier, or any other desired performance. As the sink will require to be placed in a slanting position, so that it may empty itself freely and quickly of its contents, the two ends supporting the shelves must be brought to a proper level before being fixed. The wood should be saturated by the application of several coats of mixed tar and turpentine. The angular corners of the sink, where dirt or refuse might be apt to gather, are better filled up by blocks of wood, making its interior somewhat of an octangular shape. The upper surface of the bottom might be formed of a piece of stout glass, bedded in thin putty or plaster of Paris, when it would be very cleanly, and its light colour at times prove serviceable.

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* *Funny Folks.*

As regards the pipes used for carrying off the waste liquids used in photographic operation, I have found gutta-percha utterly worthless for that or any other purpose; it becoming with time as brittle as a piece of scorched card-board. I have also tried iron, lead, copper, zinc, and wood; this last substance, if prepared in the manner I have recommended above, will last a great length of time, and is especially suitable for receptacles of waste liquids. I have had oak-casks and pails in use for upwards of twenty years. The substance I have found beyond all others serviceable for pipes is pure tin, such as is used by publicans for their beer engines.

The door of the dark room should be provided with a spring lock which cannot be opened from the outside without a key, thus preventing inopportune intrusion. The insertion in it also of a pane of coloured glass may prevent the perpetration of wanton mischief to either furniture or camera.

Recent Patents.

PHOTO-POLYCHROME.

The following specification describes M. Vidal's method of producing carbon prints in colours:—

The said invention relates to a process for the production of polychromatic or multi-coloured photographic images in any required number, and from plates obtained either by the camera-obscura or by contact in such a manner that these polychromatic images are the result of the agency of light acting through plates prepared for the purpose, and without their various colours being arranged by the aid of pencil or brush. By means of this improved process there are obtained with two, three, four, five, or a greater number of colours combining with one another by superposition, polychromatic images, visible either by reflection by applying them to an opaque body, or in transparence by supporting or applying them on or to a translucent or transparent body. Between these images and those obtained by means of chromo-lithography there exists great analogy as regards the method of production; but whilst in chromo-lithography it is necessary to have recourse to manual drawing and composition, in the case of this improved process it is simply required to employ plates obtained in the camera-obscura or by contact, and to pull off from these plates positive proofs, either by the action of light producing each monochrome by the carbon printing process, or by the mechanical means of printing applied for obtaining photographic plates without further exposure to the light after the production of the negatives.

According to one mode of carrying out this invention the process is conducted in the following manner:—From a given negative plate there are obtained as many similar negatives as are required either upon glass or upon paper by iodide of silver, carbon, or by any other suitable process, the number of these negatives being determined by the number of colours which it is desired to combine together. These negatives are arranged in such a manner that by applying or tracing with the pencil a sufficiently opaque colour, various parts of the plate are covered; for example, on the plate which should give the monochrome yellow all the parts are covered which are not to contain yellow in the condition of a simple or composite colour; upon the plate which is required to furnish blue only, the whole of those portions of the surface are covered which are not to be blue or combined with blue, and similarly with each of the other negatives intended to furnish respectively the monochromes red, brown, or other colour, as required. These reserved portions are arranged at the taste of the artist, according to the result which it is desired to obtain. The negatives thus prepared are printed from separately; with the yellow negative a monochrome of that colour is printed upon a yellow carbon mixture, and similarly with the other plates, using mixtures of blue, red, or other colour, as the case may be. The developing of the images is effected in a manner similar to that in which it is performed in the carbon process, but as a temporary support stearine paper or a polished metal plate covered with a fatty substance should be employed. After the operation of developing is completed the mounting of the polychromatic image may be proceeded with by the juxtaposition of the proofs, as hereinafter described, the position of the proofs being caused to coincide with datum marks previously made on the initial negative. The operation of mounting is performed by immersion in water, first of the sheet of paper or the permanent support, then of the monochrome which it is desired to apply first. The permanent support is covered with a thin sheet or layer of gelatine, which is softened by the water, as is also the layer which forms the monochrome; and when they are brought together by the aid of suitable pressure and left to spontaneous desiccation, the adhesion of the two layers becomes complete, whilst the temporary support is detached, leaving the image which it bore upon its permanent support, after which all the other monochromes are applied in a similar manner. When the whole of the monochromes have been thus brought together the picture which they form is immersed in an alum bath, after which it is washed with water, and finally arranged according to the purpose to which it is to be applied. It should be observed that before the application of each succeeding monochrome, the surface of the picture is washed in order to free it from any fatty or resinous substances which may adhere to it on its being separated from its temporary support; this operation may be performed by immersing the picture in a bath of ether, benzole, or any other suitable solvent of fatty bodies. In lieu of employing the action of light to obtain each monochrome, typographic or lithographic processes may be substituted therefor, in order to obtain a series of superposed tints of various colours, including metals—such, for example, as silver, gold, and the like—combined in such a manner that their united effect, added to a final shade supplied by photography with the carbon process, produces the desired result. The mechanical means for printing in colours may be employed either previously to any carbon impression by photography, or subsequently to the same, in such a manner as to superpose tints of various colours upon the photographically-printed image. Or these two modes of producing the impression may be employed with a view to the final result in such a manner as to obtain, first, the photographic impression, then the lithographic or typographic impression, for example (or vice versa), then another photographic impression, and again a lithographic or typographic impression, and so on in succession. These various processes employed alternately in this or any other suitable manner contribute by their action to form one and the same picture. With regard to the impression of various colours it is important to observe that heretofore only the mechanical means hereinbefore referred to, and which consist of lithography, typography, and engraving, have been employed for the purpose, but according to this invention the before-mentioned processes are applied in combination with photography in order to obtain by the juxtaposition of photographic proofs upon lithographed or engraved colours or tints pictures or images representing not only the exact form of the objects, but also their colours. In lieu also of employing a single photographic monochrome, two or more monochromes may be used, which, by juxtaposition, unite to form the picture or image by combining with tints or colours printed mechanically.

The process may be commenced by printing mechanically the various tints or colours in order to superpose the photographic proof thereon, or by printing mechanically upon the photographic proof the various tints or colours which are requisite for its completion, or a similar result may be obtained by alternating the two systems, as hereinbefore stated, the order being varied in any suitable manner.

Having now described and particularly ascertained the nature of the said invention, and the manner in which the same is or may be used or carried into effect, I would observe, in conclusion, that what I consider to be novel and original, and therefore claim as the invention secured to me by the hereinbefore in part recited letters patent is, the production of polychromatic pictures or images either by the superposition of a series of photographic impressions obtained in the manner herein set forth, or by the employment of photographic impressions in combination with lithographic or other impressions, substantially as herinbefore described.

COLOURING CARBON PRINTS AT THE BACK.

BY A. H. BRAUN.

The following specification describes a mode of colouring carbon prints at the back. The patent was not completed.

This invention is intended to supply an improved method for producing coloured photographic pictures which will be scarcely distinguishable from the most highly finished oil paintings, and which may be obtained at a comparatively small expense of time and labour.

I proceed as follows:—I take what is well known as a carbon photographic print in the usual manner, but for its support, instead of the ordinary "transfer" paper, which is a tolerably stout white or tinted paper, I make use of a very thin semi-transparent paper of the kind known as "papier vegetal," to which the carbon print is transferred in the usual way. I then proceed to colour the back of this print with either oil or water colours, or by means of chromo-lithography. For this purpose a very moderate amount of care only is required, the half tones and shadows being produced by the photographic picture. I then, by means of glue or other suitable cement, mount the coloured picture upon canvas, cloth, or other material upon which oil paintings are painted, after which I add such retouching or correction to the front as may be necessary, and varnish with the usual varnish.

The feature of novelty herein described relates more particularly to the use of semi-transparent paper as a support for the carbon picture, and the mounting of such picture when coloured on canvas or other suitable material which will produce a picture in imitation of an oil painting.

FIXING COLOURS ON PHOTOGRAPHS AND DRAWINGS.

BY W. E. DEBENHAM.

The following specification describes a method of fixing powder and other colours after they are applied:—

A photograph being coloured, or a drawing made with crayon powder liquid, or water colour, I immerse it in or flow over it a solution of freshly-prepared moist gluten in alcohol, the alcohol to be at a strength of about seventy or eighty per cent., or a solution of gelatine or metagelatine, or kindred substance (the word gelatine will be used hereafter to include kindred substances) in water, with as much alcohol added as the solution will bear without precipitating the gelatine. If the solution be hot it will bear a large addition of alcohol. It is necessary that the solution be very alcoholic, or the colours may run, as they would in an ordinary aqueous solution. The gelatine coating may be rendered insoluble by treatment with tannin or chrome alum; the chrome alum is either added to the gelatine solution itself, or applied separately, and afterwards exposed to light.

To prepare a photograph or drawing that colour may adhere, I apply either of the alcoholic solutions already mentioned, or a solution of glycerine or sugar, or a mixture of any of these; and this preparative liquid should contain fifty per cent. or more of alcohol in order that it may penetrate evenly. If the work can be coloured before being mounted, as in the case of a photograph to be enamelled, I apply the preparation liquid to the back of the paper. The alcohol makes it penetrate to the front, and the colour is taken in a very even and fine manner.

The fixing solutions are also applicable to water colour, pencil, and crayon drawings; and I prefer to employ gluten solution as the fixing agent, and the picture will, after this, bear coating with an aqueous solution of gelatine, if desired, as an additional coat, or for the purpose of attaching it to the collodionized glass in enamelling. The fixing solution itself may also be used for this latter purpose, and the colouring or "touching" not to be disturbed. When it is required that the gluten solution should contain more gluten than the alcohol will take up, I evaporate rapidly, but not to precipitation, a portion of the solution, and mix with the remainder.

Having now described and particularly set forth the nature of the said invention, and the manner of carrying out the same into effect, I would have it understood that what I claim is:—The use of an alcoholic solution of gelatinous substances for fixing drawings or colour substantially as described; the use of an alcoholic solution of gluten or glutenous substances for fixing drawings or colour, substantially as described; the distinctive method of rendering the surface of a paper photograph adhesive to dry colour by the application of a liquid, as described, to the back of the print.

MICROMEGAS.

BY J. H. HERMAGIS.

The following specification describes Mons. Hermagis recently invented camera for enlargements. The patent was not completed.

The object of my invention is to produce a simple, effective, and portable apparatus, equally available for photographic operations within doors and in the open air, as well as for making enlargements. I give the name of "Micromegas" to my new apparatus.

My first improvement has reference to the camera itself, and consists in forming the two sides, the top, and the bottom, of four pieces of wood joined together by hinges, which exclude the light and extend the entire length of such pieces, the points of junction of each piece being also bevelled to an angle of forty-five degrees. Such camera can thus be easily folded flat for transportation, or for otherwise economising space, and when required for use, on being unfolded, the hinges with the bevelled edges cause it to assume the shape of a rigid square, which is further maintained by the insertion of the lens board in front, and of the dark slide at the back.

My second improvement has reference to the tripod, the means of attaching the camera to the same, and to the method of imparting solidity and rigidity to the said parts when mounted for use. My tripod consists in the usual three legs, shaped so that when not in use they form a complete circle on being closed together; but instead of as hitherto making the head an independent part of the tripod, my head is a fixture on the top of the legs, and consists in a metallic disk, the diameter of which does not exceed the diameter of the upper part of the three legs, provided underneath with three horizontal pins and vertical wings to which the legs are jointed, and pierced with a central hole for the purpose of attaching the camera to the same by means of a screw with a large knob inserted from the inside of the camera; with the view of imparting rigidity, I pierce the screw as well as the metallic top of the tripod with a small central hole through which I pass a wire or twine, and suspend thereto a weight composed of any material at hand—such as stones, earth, water, &c.—bringing the same down as near to the soil as is convenient. When the camera is dismounted the screw is replaced in the disk of the tripod, and serves as the knob of a walking-stick.

My third improvement has reference to the manner of mounting the lens, and consists in making the outside of the lens tube in the shape of a swift screw, and providing the inner surface of the usual ring or washer with a similar thread, so that for the purpose of focussing it is sufficient to rotate the lens in one or other direction. The tube usually attached to the ring or washer can thus be dispensed with. A much larger range of focus is thus obtained, which is particularly useful in enlarging. For this latter purpose I fix the negative in the ground glass side, and expose it to light, excluding at the same time the passage of light or actinic rays around the negative; and then, after placing the screen to receive the enlargement at the required distance from the lens, I adjust the position of the latter by the means above-mentioned until the requisite sharpness is obtained.

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POLYCHROMIC EFFECTS IN PHOTOGRAPHY.

THERE has, perhaps, been nothing connected with photography which has been the subject of so many patents, as the attempts to produce coloured effects by mechanical or semi-artistic methods. There appears to have been a double aim in most of the processes: on the one hand, it has been sought to produce the coloured effects by a "process" which was to render the skill of the trained painter unnecessary; and on the other, the means by which the effects were produced were not to be obvious—there was to be no trace of handling or pencil work. In most of the attempts the effort has been to produce the effect of a photograph in colours, rather than that of a painted photograph. Many ingenious methods have been patented, and many of the results produced have been pleasing; but, curiously enough, none of them have ever become popular. They have attracted attention for a little time, and have then passed out of notice, and been forgotten.

There is one common principle which has characterized most of these methods, which distinguishes them from the ordinary modes of colouring or painting photographs. In the ordinary methods the colours are applied on the photograph, and the picture is, in greater or less degree, a painting with a photographic basis. In the majority of the "processes" to which we refer, the result is a transparent photograph placed over colour; the colouring being applied at the back of the transparent photograph. The result is that all the drawing, gradation, detail, and texture of the photograph meet the eye, but they are suffused with colour. The picture is unmistakably a photograph, and might in some cases be mistaken for a photograph in natural colours. Various modes of producing the effect have been devised. In some, a paper print has been made transparent by the aid of wax or varnish, and oil colours roughly applied at the back. In some cases a print has been roughly coloured, and a transparent print superposed upon the roughly coloured duplicate. A very pretty result, obtained by very simple means, at one time had a term of popularity in the United States, under the name of the *Ectograph.* It was simply a collodion transparency, coated with a film of white wax, the semi-transparent layer of which softened the very roughly applied colour laid thereon, so that viewed through the glass it was a delicately tinted miniature. When we first introduced the collodio-chloride picture to photographers, we described some similar effects we produced on the collodio-chloride image. But, as we have said, all these effects were pretty; all were much admired; but none ever acquired a prolonged popularity.

Carbon prints offer unusual facilities for this kind of treatment, and modes of applying colour at the back were tried and described soon after Mr. Swan had made the production of presentable carbon prints an easy possibility. But the inevitable patents follow. Unmindful or uninformed of how often similar patents have been obtained and abandoned, some ingenious experimentalist struck with the simplicity of the method and the beauty of the results, rushes to the Patent Office to secure protection, probably without inquiring whether such a method had ever been proposed before. We can understand something of the reason for this. The experimentalist is charmed with his discovery; he knows nothing of the kind is in use, and he feels sure that if it were known it must be in universal practice, and hence concludes that it must be entirely unknown.

On another page we publish the specifications of two patents involving similar modes of applying colours to carbon prints. One by Mr. Braun, which was only provisionally specified, and not completed, possesses an element of novelty in the substance to which the colour is applied. The carbon print is transferred to *papier vegetal,* which affords a suitable basis for rough colouring, and by its semi-transparency softens such colouring, the completed picture being mounted, if preferred, on canvas, so as to resemble an oil painting. There is little doubt that very pleasing effects might be so produced, equalling in most respects, and surpassing in others, the well-known oleographs, which are at present somewhat popular. As Mr. Braun has wisely abandoned his patent, there is not even the semblance of a barrier against any one practising the process.

The other specification to which we refer is that of M. Vidal's polychromic process, of which so much relating to its progress in Paris has been heard. Those of our readers who have seen any of M. Vidal's early work in this direction, and remember his first published process, will be a little disappointed, on reading his specification through, to find that a process resembling ordinary chromolithography is included in his patent; and to learn that it is the process chiefly the progress of which they have heard much of late. Some years ago M. Vidal conceived the ingenious idea of producing coloured photographs in carbon by a very elaborate process. It consisted in printing upon tissues of every requisite colour each part of the picture, masking or stopping out from the negative all parts but of the tint under treatment. Suppose red, for instance, occurs a few times in the original colouring of the subject, every portion of the subject but the red would be stopped out in the negative, and a red coloured tissue employed for printing these parts. So with blue, so with yellow, &c. When all the portions were so obtained, they would be mounted or transferred to their several positions, forming a perfect picture. Tedious as the process seems, we have seen some very charming pictures so produced. But we, in common with others, were puzzled when we heard that M. Vidal had commenced to apply his process commercially in Paris, and was producing prints by the thousand. Some recent examples we have seen have, however, removed the perplexity. They consisted not of a carbon print produced by the combination in juxtaposition of the parts of one picture printed on different coloured tissues, but of a carbon print mounted upon or backed by colour, produced either by hand colouring or by chromolithography. Such pictures, it will readily be seen, may be easily produced in large quantities. They may also be made very effective, their exact value depending very much upon the taste, care, and skill with which the coloured backing is produced. A graduated scale of artistic excellence is, we understand, represented by the graduated scale of charges which forms part of M. Vidal's commercial scheme.

It is not part of our province to estimate the precise legal value or force of patents obtained in connection with photography; but we may point out that the use of lithography in connection with photography, and the mounting of a transparent photograph upon a polycoloured ground, are both familiarly known, and have been patented and abandoned several times. Mr. Braun's abandoned patent includes, indeed, both points. M. Woodbury has for some years adopted a similar method in producing coloured pictures by his mechanical carbon process. Apart, however, from patent protection, it is probable that the mode of working may be for many purposes commercially successful, and if M. Vidal introduces it in this country—as we understand he contemplates doing—with the same enterprise as in Paris, it is probable that it will create for itself a commercial groove which it will satisfactorily fill.

RISKS OF PYROXYLINE COMPOUNDS.

A paragraph has recently "gone the round" of the press describing the sudden combustion of a billiard ball which had come into contact with an ignited cigar. The ball, as it was subsequently ascertained, was made of a pyroxyline compound known in this country under the name of *Parkesine*. This material, which is used as a substitute for ivory, is made of a mixture of pyroxyline, camphor, castor oil, and various pigments, and being plastic when mixed, and very hard when dry after the manufacture is completed, it naturally lends itself to a variety of purposes. Amongst other purposes to which it has been proposed to apply Parkesine are the manufacture of inner frames for dark slides, tablets for photographic miniatures, picture frames, &c. A correspondent, referring to its use for those purposes, asks if the substance is explosive in its manufactured state. The somewhat sensational headings given in different papers to the paragraph to which we have referred, describing "A New Infernal Machine," "A New Torpedo," "A New Explosive," &c., naturally suggest some danger in using the compound in question. There is no reason, we think, whatever, to apprehend any risk of explosion. But Parkesine and similar pyroxyline compounds are very readily combustible, and the billiard ball described is said to have burnt rapidly rather than exploded. For the purpose of testing its qualities in this respect, we took a tablet of Parkesine resembling ivory, and applied a light to it. Nothing resembling an explosion followed; but it burnt readily, with the kind of combustion seen in wet gunpowder or the sulphocyanide compound known as Pharoah's Serpents. After combustion the tablet remained (in, of course, a very friable state), the residue being ashes and some kind of incombustible pigment combined with the pyroxyline in the original manufacture.

The chief danger to photographers which is likely to arise from pyroxyline is the spontaneous decomposition of examples put away and forgotten, in the hands of those occasionally fond of experiment. Very few photographers in the present day incur the risks involved in manufacturing pyroxyline for their own use; but many occasionally purchase a sample for some experiment, after which they put the residue away in a stoppered bottle, and forget all about it. In this way an occasional risk is incurred which is better avoided. At the International Exhibition of 1862 some fine examples of photographic chemicals were contributed from Berlin, many of which were, at the close of the Exhibition, bought by Dr. Diamond. Amongst these was a glass jar containing pyroxyline, which was kept for years, and remained perfectly good. It was noticed on one occasion, however, that some trace of red nitrous fumes appeared in the bottle. The lid was removed, the fumes escaped, and the pyroxyline for the time showed no further appearance of decomposition. In a few days more, however, it was found to have disappeared, leaving a small quantity of gummy liquid at the bottom of the jar. Had not the lid been removed the decomposition would probably have issued in spontaneous combustion with explosion and fire. Some collodion films removed from the plate and kept in a glass jar shared a similar fate in another studio.

This fact suggests a possibility—of which, however, we have met with no actual example—namely, the possible decomposition of collodion negatives which have been removed from the glass, especially in those cases where the *couche* to which they are removed consists also of a film of leather collodion. In our own hands small examples of pyroxyline have more than once decomposed when kept in a stoppered bottle, but never when kept loosely in an uncovered jar. This suggests the probability that pyroxyline exposed to the air is less subject to the causes of decomposition than when it is sealed up from atmospheric action. At present we have never met with or heard of any form of injury, beyond mechanical rupture, occurring to a negative film which has been transferred from the glass.

PORTABLE SCREENS AND REFLECTORS.

The French Correspondent of the Philadelphia "Evening Bulletin" is enthusiastic in describing the effects produced by portable screens and reflectors in the studio of Mons. Klary, a photographer in Algiers. How far the coloured linings to the screen effect any practical purpose beyond impressing the sitter, we will not undertake to determine. The correspondent in question is not very complimentary to photography pure and simple. He says:—

"Photographs, as is well known, are never absolutely correct in all the parts, as regards either the drawing or the distribution of light and shade. The outline will be incorrect in part, and the shadows too deep, and lights too vivid. Photography left entirely to itself is ruthless and rugged, and reproduces everything with a hard and harsh fidelity; making no choice or selection, as an artist would, in seizing essential traits, and toning down what is only accessory. Sir Joshua Reynolds once said of the painting of a 'Lady and an Apple Tree,' that it was an admirable representation of the latter, but in no sense a portrait of the former. Were two such objects presented to photography, it would take just as much pains with the one as with the other. And so an ordinary photographer treats his subjects, whether animate or inanimate, on a footing of equality. The artist-photographer, on the contrary, uses, or endeavours to use, light just as he would paint on his brush. Light is his palette; and, in the proper distribution of it over his subject, consists the true art of the photograph. But the acquirement of this art, like everything else, demands both much study and long experience, and dexterity, as well as adaptation to times, seasons, colours, complexions, &c.

"M. Klary professes, by the aid of a 'screen (écran) with a movable coloured head to it,' to have put into the hands of photographers just the 'brush' which they required wherewith to 'paint with light.' I shall not attempt any minute description of the apparatus, which is, however, extremely simple, consisting of a screen of white, blue, pale red, or pale orange calico, according to circumstances, fixed on a stand, with an ingeniously contrived motive power, and which, placed behind the subject, enables the operator to regulate and distribute the lights absolutely at will, until all is brought into due harmony and good keeping in the 'picture' which he is about to reproduce. The above instrument, combined with the use of a concave reflector of a pale rose or yellow tint, enables the operator to bring out, in relief, all the features of a portrait which require to have more light thrown upon them. The productions of M. Klary, obtained by the above process, are very pleasing, and have been much admired in Paris. Another part of his system, also, is that the whole face, in a photographic portrait, should be all more or less shaded, none of it left absolutely crude or white; just as, in playing the violin, to borrow an illustration from the sister art, no string is ever left entirely 'open,' nor any true note produced without the feeling and action of the finger of the musician. In a word, the system of M. Klary is intended to replace advantageously the whole clumsy apparatus of curtains, blinds, shutters, reflectors, and counter-reflectors, head screens, &c., which one sees generally employed, and which often serve only to humiliate both the operator and the subject, and produce confusion, instead of artistic adjustment and distribution of light and shade."

THE MODERN PHOTOGRAPHER.

BY CHARLES PEARCE.

I had been out of England for a long while, and had forgotten all about photography; but my friends had not, and, of course, when I paid a visit to the old country, nothing would satisfy them but that I *must* have my portrait taken. Well, I had been in the profession many years ago, and knew something about it, and you can guess I had to be persuaded a good deal before I would consent. But when I found myself in the studio, and smelt the old familiar smell, it was like going back to old times, and I was glad, after all, I had come.

He was a nice young man, was the photographer; but, bless me, he didn't remind me of what I remember when *I* was in the profession. Why, he actually wore white wristbands, and there wasn't a stain on his fingers. I know *mine* used to be black enough. But, there, that was fifteen years ago, and things have improved since then, I suppose. He didn't even trouble himself to go into his dark room; and as for his hair, why, it was just as if he'd come out of a hairdresser's shop. *He* didn't put his head under a focussing cloth, I'll warrant you. But, for all that, he was very chatty and pleasant; and when he found I knew a little of the mysteries, he talked away as if he'd known me for years.

"I suppose you've got a few new styles now-a-days?" said I, when we'd fairly got into conversation.

"New styles? I should think there were. Look here. This is an Enamellographotype—cost me a lot of money, I can tell you."

"Did it, though. But, I suppose, you make it pay?"

"The inventor did—I didn't. *He* could do it easily enough; but, somehow, the process wouldn't work in my hands, so I gave it up."

"What's this?" said I, pointing to a specimen of a different kind.

"Oh, that's a Physionometype. Very clever fellow who invented that. Sold me completely!"

"You mean, you bought his invention."

"Yes; but I didn't buy his secret. The thing's no good —won't work."

"Bless me! But those photographs I saw in your reception-room—beautiful things, some of them were—they were only ordinary silver prints, were they not?"

I fancied I saw a blush on the young fellow's cheek as I said this, but I might have been mistaken.

"Yes, they're silver prints, right enough, but—well, I don't mind telling you—they're not mine at all. Friend of mine did them."

"I see. And he lends them to you as specimens of your work?"

"Yes, that's it. Good idea, don't you think so?"

I observed that the plan was a capital one, and was going to say something more, but the photographer, somehow, didn't appear to like the subject, and hurriedly pushed into my hand a fresh example. I couldn't quite make out what it was, but I said it was very nice.

"Yes," he said, enthusiastically, "that's the most artistic style yet brought out. It's called the Photolithoengravotype, and combines all the best qualities of the photograph, the lithograph, the engraving, with just a dash of the crayon and a little of the miniature. I'm having lessons in it. It's very expensive, but we must keep pace with the times."

"Certainly," I remarked.

He held the picture a little distance from him, and looked at it admiringly,

"How grandly those broad masses of shade blend with the outlines!" he exclaimed, rapturously. "What feeling! What tenderness! Do you notice that mellow lusciousness about the half tints? I can't tell what it is, but there's a certain indescribable 'nothing' that pleases me immensely about the process."

I didn't know exactly what he meant, but I suppose it was because I couldn't see the "nothing," although I'm sure I looked very carefully.

"Of course you are a draughtsman?" said I, hearing him talk so finely.

"Eh? Oh, no, it would be of no use to me. I did join a drawing-class once, but it didn't suit my book. Stuck me down before a white ball, and told me to draw it, as if *that* would have taught me anything. No, drawing don't pay; besides, the public don't care for it."

"You've got a good many properties," said I, looking about the studio.

"Rather. I go in for the real," he answered. "Here's a splendid thing. You can make fifty different objects out of it, including the deck of a man-of-war, cannon and all that, a fireplace, and a piano. Oh, there's nothing like the real thing to suit the public taste, depend upon it."

By this time the assistant had come out of the dark-room with the negative of myself, and I asked permission to look at it.

"It's a long time since I saw a negative, but isn't this rather under-exposed?"

"Well, perhaps it is; but it don't matter," said the photographer, unconcernedly.

"Doesn't it? Well, now, I should have thought this would not be printed at all."

"Oh, you are thinking of the old way of doing things."

"The old way?" said I, a little mystified. "Why, a negative must be exposed a sufficient time to print properly, mustn't it?"

"Oh, dear, no. Quite a mistake. The French and the Germans have taught us a much better plan."

"You don't say so. And what *have* they taught us, if I may ask such a question?"

"Why, the very best thing that was ever discovered for photographers; and the beauty of it is, we havn't got to pay anything for the royalty, like all those other processes."

I began to be quite anxious about this wonderful discovery, and I begged the young fellow to enlighten me.

"Oh, it's no secret, at least to photographers, although the public don't quite know it; and it's great fun to hear the women wonder why photography makes them so much handsomer than their looking-glasses. It's just this—Retouching"

"Re-touching? I don't quite understand," I murmured.

"Don't you? It's simple enough. Retouching is improving the negative with a pencil or brush, and, I can tell you, it saves a thundering deal of trouble. Why, we can touch up a nose there, shorten a lip there, make the eyes brighter, put eyebrows where there wern't any before, curl the hair, dimple the chin, make a squint all right, smooth the forehead, take out crowsfeet, improve the ear, deepen the shadows, heighten the lights, make a frown into a smile, a smirk into dignity—"

"Bless me, what an extraordinary discovery!" I ejaculated, involuntarily.

"I should just think it was. Nothing like it, sir, to suit the public. Just look at these," and he handed me a dozen or so of cartes-de-visite.

"You wouldn't think the originals were cross looking and ugly, their faces full of blotches, their noses snubs, or their mouths crooked, would you?"

Certainly, none of the photographs he showed me had any of these attributes. They were as nice a set of smooth inane, pretty countenances as you'd meet with anywhere, not excepting Madame Tussaud's. The predominating expression was utter vacuity, and I would undertake to defy Lavater, and all his disciples to boot, to discover the disposition of any one of them by the features as expressed in the photographs.

"They are very pretty," said I; and I felt I could not pay them a higher compliment.

"And yet some of the sitters were the ugliest people you ever saw. The rest were under-exposed; but what is the use, when you can retouch, of bothering about a fresh sitting?"

I did not reply. I could not. I had painful recollections of taking twelve or more negatives of one sitter before I could please myself, and this revelation fairly paralysed me.

"I am much obliged to you, sir," I gasped, at last, "for your frankness. I have only one favour to ask of you—that you won't 'retouch' me more than you can possibly help."

"Well, that's a matter I never interfere with. You see, I keep a staff of artists, and they suit their own tastes as to what the face ought to be. Artists are confoundedly difficult fellows to deal with. They're so fond of preaching about art, that I let them have their own way."

I bade the candid photographer good-day, and waited with some curiosity for my portrait.

It came. Yes, it was very pretty—very pretty indeed. In fact, it had only one fault—it was no more like me than Cardinal Manning is like the Fat Boy in "Pickwick." I am bound to confess, the "retouching" was perfect.

MULTIPLICATION OF CLICHES BY THE CARBON PROCESS.*

In many cases the multiplication of clichés is a matter of great importance, as, for instance, when a large number of impressions are urgently required either in silver or pigments; in this case the original negative cannot furnish the requisite number in the proper time, and, moreover, it is so valuable that you hesitate to expose it to too much work in the pressure frame. For this reason, we are often glad to secure duplicates which will yield us copies in large numbers, and which differ but little from the original plate.

When it is desired to obtain clichés in the same sense as the negative, the negative is bordered with a margin of black paper, and then exposed in a printing frame with a piece of tissue, having little gelatine in its composition, so as to prevent any unevenness in thickness, and well charged with reddish colouring-matter, which has been well ground and filtered. For this work a specially prepared tissue is, indeed, necessary, for if the sensitive mixture contains but little colouring matter, the image lacks intensity; if, on the contrary, the tissue is too much charged with colour, the impression produced will be not only too dark, but it will want detail.

The sensitizing of the tissue is conducted in the manner of ordinary tissue, but on withdrawal from the bichromate bath, it is placed flat upon a sheet of clean glass, face downwards, and the squeegee is then passed over it; after remaining for five minutes in this position, the tissue is removed from the plate and put to dry. This operation has for its object to give to the tissue a very fine and even surface, so that it may lie perfectly flat against the negative film when in the printing frame.

The period of exposure varies, as a matter of course, with the intensity of the clichés and the state of the light; but the printing must be pushed far enough to get all the details of the image completely printed, so that, viewed by transmitted light, it makes a good positive when placed behind a ground-glass. As an approximate time, one may consider that such an impression requires double as much exposure as an ordinary pigment print which is to be transferred to paper.

The development is conducted upon a sheet of glass upon which a film of collodion has been spread, but no wax; after drying, this positive print, which is easily retouched wherever necessary, is exposed to the light with another sheet of sensitive tissue under it, as before. In this case, however, the exposure must be much shorter than in the first case, so that the negative impression resulting from it possesses transparent blacks and vigorous whites, for the same will not turn out favourable unless it has the effects of the original cliche, not so much as regards tint as harmony. One single trial will do more than any amount of advice in order to fix the proper degree of intensity.

The negative impression thus obtained is scarcely serviceable unless it is from a very hard positive produced by means of silver salts; as a general rule it is far too flat and vigourless, and to give it intensity, therefore, a bath is employed, composed of—

Ordinary water	250 cub. cent.
Permanganate of potash ...	2 grammes.

This liquid, filtered or not, is put in a dish with the cliche to be intensified, which, in a few seconds, changes in tint and becomes of an orange yellow tone, more or less deep according to the quantity of permanganate contained in the solution.

This operation may be performed in full daylight, and a cliche thus treated will assume in a few moments an anti-photogenic tone which imparts to it all the intensity desirable. The operation is brought to an end by washing the cliche thoroughly with cold water.

In certain cases the positive itself may be intensified in this bath before the negative impression is printed from it, but as a rule it is preferable to have a positive full of detail and harmony, and to intensify the negative. In any case it is necessary to follow the action of the permanganate with care, as it acts upon the gelatine very rapidly. As it is possible to repeat the process as many times as may be deemed necessary, it is better to stop short too soon rather than have a cliche that is too hard and vigorous.

As permanganate of potash has the property of rendering gelatine completely insoluble, it is not necessary to fix the image in alum; but if the cliché is to serve for printing a large number of copies, then it is well to have it varnished

Clichés produced by this method have all the fineness and detail of the original negative, and are printed much more quickly than silver plates.

It is possible to intensify carbon negatives sufficiently by having recourse also to the undermentioned solution:—

No. 1.—	Warm water	1 litre
	Gallic acid	30 grammes.
No. 2.—	Sulphate of iron	40 grammes
	Acetic acid..	40 ,,
	Ordinary water	1 litre.

Gallic acid being but slightly soluble in cold water, the liquid must be warmed until the acid is completely dissolved; at the moment of using it, the cliché to be intensified is plunged into a dish containing sufficient of the iron solution to cover the plate, and then, after the latter has been immersed for a moment, it is laved in the gallic acid solution. The application of the two liquids is alternated until enough density has been secured.

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* From M. Liebert's new work, "La Photographie au Charbon."

If it is desired to secure reversed clichés by this method, for printing by the single transfer process, the operation of preparing the positive is the same as the preceding, but its development is undertaken upon a *waxed and collodionised* plate; then, as soon as the image has been secured, and while it is yet wet, it is covered with two or three successive coatings of gelatine solution of ten per cent. strength. As soon as the gelatine has set, the plate is plunged for a few minutes in a five per cent. alum bath, when it is dried, and covered finally with a film of normal collodion.

The pellicle is then detached from its support by passing the point of a knife round the margin of the film; to obtain a negative cliché, it suffices to proceed as already explained, having a care to put the tissue in contact with that side of the positive which adhered to the plate, when it is exposed to light in the printing frame.

In this case, you possess a transparent positive upon a pellicle which will serve for the production of negative clichés, either reversed or otherwise.

The two methods we have just described will be found most useful applications, but there is a third which we recommend especially, as it permits one to obtain, with the same facility, reversed clichés, whose delicacy leaves nothing to be desired, while at the same time it allows one to modify the dimensions of the original photograph, by diminishing or augmenting its proportions. Enlarged clichés of a most perfect character may be obtained by its means.

To do this, the transparent carbon positive resulting from the cliché to be reproduced is put into contact with an opal glass plate, and placed in a dark-room, against a window of ground glass. Then a lens is directed from the opposite side, taking care that the light can only penetrate through the transparent image, and a plate is taken by means of the ordinary wet collodion process, which will be similar to the original negative, supposing the pellicle of the positive is turned outwards, or reversed, if, on the contrary, the film is nearest the lens during the operation.

The nature of the original cliché may be modified by rendering it more or less soft, or vigorous, according as the negative taken receives a long or short exposure; as the negatives may always be intensified, it is possible to give them any amount of vigour. By operating with care, it is possible even in this way to secure a better cliché than the original.

The application of a ground glass at the back of the positive has the effect of giving increased softness and harmony to the cliché, but at the same time it takes away from the light, so that a longer pose becomes necessary. It may be suppressed, therefore, in dull weather, if the cliche is uniform in tone. In this case a ground glass placed before the window, at some distance from the negative, suffices to diffuse the light.

MAGNETIC PHOTOGRAPHY.

The *Scientific American* notices a lecture delivered by Professor Barker at the Stevens Institute of Technology, and described in the *Scientific American* of March 18; one of the most striking experiments was the exhibition of the magnetic spectrum upon the screen. The name magnetic spectrum has been given by physicists to the arrangement which iron filings assume under the influence of the poles of a magnet; and these spectra afford a convenient means of studying the lines of magnetic force. Professor Mayer's method of rendering magnetic spectra permanent will enable any one to obtain plates from which an engraving may be made.

Having dissolved shellac in strong alcohol, it is allowed to stand for a week or more until it is perfectly clear. It is then decanted and flowed over a thin glass plate, just as photographic plates are coated with collodion. After carefully drying for a day or two in a place free from dust, "the plate is placed over the magnet or magnets, with its ends resting on slips of wood, so that the under surface of the plate just touches the magnet. Fine iron filings produced by drawfiling Norway iron, which has been repeatedly annealed, are now sifted uniformly over the film of lac by means of a fine sieve. The spectrum is then produced by vibrating the plate by letting fall vertically upon it, at different points, a light piece of copper wire. The plate is now cautiously lifted vertically off the magnet, and placed on the end of a cylinder of pasteboard, which serves as a support in bringing it quite close to the under surface of a cast-iron plate (1 foot diameter and ½ inch thick), which has been heated over a large Bunsen flame. Thus the shellac is uniformly heated; and the iron filings, absorbing the radiation, sink into the softened film and are fixed."

When the plate is to be used for photographic prints, the heat is kept up until the metallic lustre of the filings disappears by their complete immersion in the shellac. The photographic prints will exhibit the lines of force in white upon a black ground. When the plates are used for exhibiting them upon the screen, the lines of force will appear black. When prepared with great care, such plates may be used for the most accurate measurements of the magnetic field.

MICRO-PHOTOGRAPHIC RESEARCHES UPON THE TRANSFORMATION OF COLLODION IN PHOTOGRAPHIC OPERATIONS.

BY M. J. GIRARD.*

The microscopic examination of collodion allows one to recognise the nature of the texture of the film, and to follow the reactions which take place in the production of the photographic image. When of good quality, the plate should be translucid and colourless, the pyroxiline having been completely dissolved; but age, and the reactions of the sensitizer, change the colour of the film.

The micro-photographs exhibited show some of the most frequent phenomena met with. Firstly, there is old collodion, which gives fine images, but whose rapidity leaves much to be desired; it contains liquid bubbles of modified ether. If this collodion contains too much alcohol, it has the appearance of a cellular tissue; and if it contains water, the fibres of cotton become apparent under the form of flocculent matter. Secondly, there is a specimen of very thick collodion that is too intense, and without any rapidity; this has the appearance under the microscope of a cellulo-vascular tissue, of an undulated character. This defect in the regularity of the film is injurious to the clearness of the image to be reproduced.

Two other specimens submitted show the collodion at the moment when the action of the nitrate bath is incomplete, and when this action has been perfectly accomplished. In the first specimen, the oily marks which are the indication of an interrupted reaction are filled with striæ and groups of crystals, some in the form of needles, and the others amorphous, certain portions of the plate having very fine details. It would seem as if certain crystals of iodide of silver in course of formation have been arrested in their development. In the second plate the operation of sensitizing has been completed, and in this the texture of the sensitive film is homogeneous and compact. The film of collodion, in this case, is covered with a network of much regularity, rendered still more apparent from the circumstance that several portions of the plate are free from crystallisation.

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* Read before the French Academy of Sciences.

The greater part of the photographic reactions necessary to obtain an image are carried out by the successive transformation of the crystallographic system. The reaction of iodide of silver is the most susceptible. By undertaking a microscopic investigation of the collodion film, and enlarging this to a medium scale, the operator is enabled to judge of the success or otherwise of the process he is employing.

ON THE ACTION OF SENSITIZERS AND ACTINIZERS.

BY DR. H. VOGEL.

In the December issue of the *Mittheilungen* I published a paper on the action of different sensitizers or preservatives on bromide of silver. I pointed out that well-known sensitizers (as tannin, gallic acid, pyrogallic acid, morphia). which highly increased the sensitiveness of a dry iodide of silver film, have not only no sensitizing action—or but a very slight one—but even sometimes a retarding action, on dry bromide of silver prepared in the bath; that is, in the presence of an excess of nitrate. I have recently continued these experiments with bromide of silver in emulsion prepared with a very slight excess of alkaline bromide or chloride. Under this condition the behaviour of the sensitizers is quite different.

All the sensitizers which did not act in a favourable manner on bromide of silver prepared with an excess of nitrate, did act very strongly on bromide of silver prepared with a slight excess of alkaline bromide, and increased in a striking manner its sensitiveness.

The reason why the organic sensitizers do not act in the presence of even a very slight excess of nitrate of silver may be found in the analogous fact, that reducing organic bodies in the nitrate bath very much decrease the sensitiveness of the plates prepared therein, and it seems that bromide of silver is much more affected by them than iodide.

Further investigations have confirmed the opinion given in my last letter, that dyes like Magada red and cyanine make the bromide of silver sensitive to the yellow and orange rays of the spectrum only in the presence of a trace of free nitrate of silver, or any other suitable sensitizer, as tannin, morphia, &c.

The fact that the well-known sensitizers do not sensitize under certain conditions, as above mentioned, gives an explanation of the strange phenomenon that certain actinizers (as I would propose to call the dyes which make bromide of silver sensitive to the less refrangible rays of the spectrum) do not always show the expected action. For instance, Captain Waterhouse and I have tried various blue dyes, which absorb optically the yellow rays, and do not even actinize these rays as they should, according to my theory. Further investigations must be undertaken to point out under what conditions the dyes mentioned show the actinizing actions expected from their optical properties. Magdala red and cyanine actinize the best in the presence of a trace of the nitrate of silver, but less so in the presence of tannin and morphia.

It may be possible to find dyes which act as sensitizer and actinizer simultaneously—*i.e.*, such substances as absorb optically the less refrangible rays, and chemically, iodine, bromium, or chlorine. Dyes of this description will show their properties, very probably, best on plates prepared with a slight excess of alkaline bromide.

More details in my next paper.

Correspondence.

THE DAILY ILLUSTRATED NEWSPAPER.

Sir,—This question threatens to become an interesting one to rash capitalists, being tempted by the seductive logic of Mr. Dallas, or the energetic editor of the *London Figaro* (who also seems anxious to start a daily illustrated newspaper) may rush blindly into this enterprise without considering whither it may lead them.

I think we may dispose of the question of the possibility of producing printing clichés with sufficient rapidity; Mr. Dallas claiming the power by his tint process of making a block in twelve hours; the advertiser in *Figaro* confidently affirms that he is in possession of a process for producing printing blocks in a very short time; and should these fail, I can produce fac-simile relief blocks for printing in the ordinary press, *in six hours*, by a chemical process.

When at Exeter a short time since, I saw a Mr. Harefield produce most wonderfully finished caricatures with lightning rapidity, who could, no doubt, furnish drawings of the "taken on the spot," or "by an eye witness" order, rapidly enough for a special edition even—then we might have the picture of a scene from the latest new play served up with hot rolls and coffee at breakfast the next morning.

But I am not on the look-out for a capitalist to join me in the production of a daily illustrated newspaper, though should any one, with a few spare thousands, feel that it his destiny to start one, I would sacrifice my personal feelings, such is my public spirit, to aid him—at a sufficiently compensating salary!

The obstacle in the way of such an enterprise is not in the impossibility, or difficulty even, of producing the blocks in the time, but in making the events of each day of sufficient interest.

The *New York Daily Graphic* has been cited—not, I think, very happily—as an example of success in this direction. Most of the pictures were (I speak only of the time I saw it every day in New York) reproductions of the blocks of its London namesake, the *Illustrated London News*, and the London comic journals. The original illustrations were principally of accidents, fires, murders, and, for a considerable time, of the balloon which was to have sailed to Europe. A great many really interesting and valuable pictures have been produced, I am aware, but the pictorial tone of the paper was of a decidedly low standard; nor was this, I believe, an editorial fault—for the reading matter was, perhaps, rather above the ordinary of New York papers—but is attributable only to the impossibility of getting incidents of interest to illustrate. Can this be doubted if we look at our own weeklies—how they worry a subject—such, for instance, as the Prince in India. A daily illustrated must degenerate into a gazette of police news, and thus become a social nuisance.

Another obstacle, and a serious one, is the almost certain failure financially. The *Daily Graphic* is, or was, published by a lithographic engraving company. And if they did not profit by the balloon hoax already mentioned as a means of advertising their paper, and getting money by the exhibition of the balloon and aëronauts, without any intention of sending them to Europe, appearances certainly very much wronged them.

Admitting, then, that it is quite possible to produce a daily illustrated paper, I am decidedly of opinion that it is not desirable; that it must of necessity deal largely in illustrations of deeds of violence, which are even now, in the circumstantial word-pictures of the reporters, brought only too prominently before us; and that it would not pay.—Faithfully yours, Goosequill.

Talk in the Studio.

Barium in the Negative Bath.—A correspondent sends the following:—"A nod to blind horses. When a bath is made up too acid, add BaO instead of $NaO\,CO_2$, and kill two birds with one stone."

A New India-Rubber Cement.—A good cement, that will render india-rubber in any form adherent to glass or metal, is ofttimes a desideratum with photographers, and in the *Polytechnisches Journal* for last month there is a simple recipe given for the preparation of such a compound. Some shellac is pulverised, and then softened in ten times its weight of strong ammonia, whereby a transparent mass is obtained, which becomes fluid after keeping some little time, without the use of hot water. In three or four weeks the mixture is perfectly liquid, and when applied, it will be found to soften the rubber. We are told that the rubber hardens as soon as the ammonia has evaporated again, and thus becomes impervious both to gases and to liquids. For cementing the rubber sheet, or the material in any shape, to metal, glass, and other such surfaces, the cement is strongly recommended.—*Scientific American.*

Negative Varnish.—An excellent varnish for photographic negatives, says a contemporary, is made of 3 ounces bleached shellac dissolved in 24 ounces alcohol. Filter when dissolved, which will be in one or two days; then add gum sandarac 1 ounce, essential oil of lavender 1½ ounces. Filter again, and bottle for use. This varnish will not, however, be a very hard one, as lac loses much of its hardness and tenacity in the process of bleaching, and sandarac is not a hard resin.

Discovery and Application.—A recent scientific report has some admirable remarks on the importance of discovery in the abstract apart from the practical uses to which it may be applied. It says:—"Knowledge goes before the application of knowledge, and the application of a discovery is seldom foreseen when the discovery is made. The first origin of a great discovery is often, like the germ of the natural life in an animal or a vegetable, so small as to be scarcely perceptible, and yet it may contain in it the seeds of the grandest results. 'Who,' says Helmholtz, 'when Galvani touched the muscles of a frog with different metals, and noticed their contraction, could have dreamt that . . . all Europe would be traversed with wires, flashing intelligence from Madrid to St. Petersburgh with the speed of lightning? In the hands of Galvani, and at first even in Volta's, electrical currents were phenomena capable of exerting only the feeblest forces, and could not be detected except by the most delicate apparatus. Had they been neglected on the ground that the investigation of them promised no immediate practical result, we should now be ignorant of the most important and most interesting of the links between the various forces of nature. . . . Whoever, in the pursuit of science, seeks after immediate practical utility may generally rest assured that he will seek in vain.' As we have seen, Harvey's great discovery has been followed by remedial consequences of inestimable value, but those consequences were not foreseen by himself at the time that he made the discovery. It was, at the time that he made it, 'a mere scientific discovery.'"

To Correspondents.

St. Mungo.—We do not know of any patented process under the name of "Chromotype" but that of M. Lambert, which has been fully described in our pages. We have heard of a similar process being taught; but we know nothing of it, certainly, but have heard that it resembles the method of M. Lambert.

Carbon.—There was a little work published some years ago, by the late Mr. Blair, of Perth, describing some unpatented carbon processes; but we do not know now where a copy could be obtained. The best book on the subject is the Manual of the Autotype Company, and the processes there described, although patented, may be practised by an amateur, as the Autotype Company—the owners of the patent—permit amateurs to use their processes.

Archer Clarke.—The "gold" printing—or, more properly, the printing with bronze powder—is, beyond a question, the cause of the spots. It is utterly unsafe to use mounts so printed.

X. Y. Z.—As a rule, a photographer's glass house must be built on plans provided for the necessities of the immediate position. That of the gentleman you mention answers well; but it had to be erected on an existing building, and to suit a south light. Few people would select a south light as a matter of choice, as it at best involves difficulties requiring considerable skill to overcome. If you have choice of position, let your building stand east and west, so as to secure a north side light. The size 24 feet by 12 feet will do well, the height 7 feet at eaves, and 12 or 14 feet at ridge; about six feet opaque at each end of north side and roof, the rest of these glass; about half the amount of glass on south side; glass to within two feet of the ground. The material will, probably, be decided by the law in some local building act. In London a studio must be built of brick or stone where it is not glass. A building of wood and glass alone is not permitted.

Prestwick.—To copy a card or any other picture the same size as the original it is necessary to expand the camera to double the focus of the lens, placing the picture to be copied just the same distance from the lens as the ground glass. For instance, if the equivalent focus of your lens is six inches, expand the camera to twelve inches, and place the card to be copied also twelve inches from the lens. The size of the lens does not affect the matter; it is the focus which determines the distance.

J. T. Bainbridge.—The result you describe—the image rapidly becoming white when immersed in a solution of bichloride of platinum—is very common. It is due to excess of hydrochloric acid, which rapidly converts the image into chloride of silver. To avoid this risk, it is best to neutralize the platinum salt at the outset, by freely adding carbonate of soda. Then slightly acidify by adding nitric acid. It is well to use the solution tolerably dilute.

J. Aubrey Clark.—French glue is a fine clear glue, closely resembling the gelatine used in cookery. In London it is generally obtainable in the oil shops. If you cannot get it, use gelatine.

W. H. Wheeler.—Mr. Dallmeyer's paper on Flare was read before the Photographic Society about six years ago, so far as we can remember, and was published at the time in the Photographic News, and in the Society's Journal. As we write this from home, far from opportunities of reference, we cannot give you the precise date. It is probable that if you write to the author he can give you precise particulars.

A Distracted Amateur.—The vagaries of the nitrate bath are, beyond a doubt, often distracting. But, after all, it is scarcely surprising when we consider the complex constitution of a bath which has been in use for a time, and doctored once or twice. It may be possible partly to compute the reactions of the voluntary additions made to the solution; but who shall say how these are complicated by the incidental accumulations of ether, alcohol, soluble portions of pyroxyline, iodides, bromides, and unknown possibilities? The sandy deposit seems to spring from so many causes, that it is impossible to say precisely what cause is in action when it appears. Try a further addition of the barium salt.

W. Howard.—We will endeavour to get the address in question, and let you have it. We do not at present know it. Thanks for calling attention to the oversight. Copies shall be forwarded in a few days, when we reach home. At present we are many miles from London.

G. Croughton.—Thanks. Your note has reached us, but not the specimen and copy, and probably will not now in time for this week. The matter shall have attention in our next.

John Worsnop.—Many thanks. In our next.

Several correspondents in our next.

Advertisements and communications for the Publishers should be forwarded to the Photographic News Office, 15, Gough Square, Fleet Street.

PHOTOGRAPHS REGISTERED.

Mr. J. Chancellor, Dublin,
Photograph of Duke of Abercorn.

Mr. T. H. Redin, Carlisle,
Photograph of the late W. N. Hodgson, M.P.

Mr. Gregson, Luton,
Four photographs of Rev. J. Tuckwell.
Photographic group of Rev. J. Tuckwell, and six deacons of Union Chapel, Luton, Bedfordshire.

The Photographic News, May 12, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

PHOTOGRAPHY AND PISCICULTURE—PORTRAITS OF LIVING FISH—MOVABLE DARK ROOMS.

Photography and Pisciculture.—There is no application of photography more valuable than its employment as a recorder of facts and phenomena, and scarcely a science can be cited that does not now-a-days bear witness to such being the case. In microscopic science, and astronomy especially, many wonderful examples may be mentioned of the way in which photography has helped to develop our knowledge, as everybody knows full well; but few are aware of the camera having been employed in recording facts connected with the subject of pisciculture. At recent exhibitions that have been held by the Photographic Society, our readers may have seen one or two photographs of salmon and other fish, executed by Mr. Robert Crawshay, of Cyfarthfa Castle, and these form part of an extensive collection of pictures of this kind which that well-known amateur has portrayed. Although, no doubt, Mr. Crawshay commenced his series of pictures more for the purpose of perpetuating some of the finer examples of salmon which had been taken by his rod, he soon went a step further, and secured facsimiles of any curiosities in pisciculture which came under his notice as a practised fisherman. To demonstrate, for instance, that the end of September and October is too late to keep open the fishing season, Mr. Crawshay shows us pictures of salmon killed at that late period of the year whose ova amounted to hundreds of thousands. We see photographs of emaciated fish, big and weighty enough to please the most fastidious angler, the weight being due, however, in great part, to the large masses of eggs or roe attached. These fish, when taken, were on their way up the river to spawn, and thus, by allowing "the open-time" to extend to so late a period in the year, the waters are deprived of so many young salmon. It is easy to understand how it is that the fish in our own rivers are gradually diminishing, when one looks at the interesting salmon pictures of Mr. Crawshay, and a study of them (for the date of killing, weight, and other particulars, are attached) would teach much as to the proper limits of close and open time for salmon fishing. It was some of these pictures which attracted the attention of Mr. Frank Buckland, the Government Inspector of Fisheries, last year, and which that gentlemen at once forwarded to the Maritime Exhibition at Paris, then being held. They now form part of the records kept by the Inspector at the Home Office; but since these came into the possession of Government, we believe, Mr. Crawshay has further augmented his interesting collection of fish photographs.

Portraits of Living Fish.—The subject of fish photography puts one in mind of an early attempt, which was attended with considerable success, to depict a live fish in water. The task was accomplished a score of years back by Mr. Pollock, the son of the late Chief Baron, and one of the first to establish a fresh water aquarium. Mr. Pollock had, among other fish in his aquarium, a very fine pike, which would remain so quiet for hours together, that the possibility of securing its picture on a sensitive plate at once became evident. The pike being lighted up sufficiently by the rays coming through the window, the camera was properly adjusted. It was noticed that the animal at the time was intently watching a small roach, which kept swimming to and fro in front of some rock-work, and while its attention was thus engaged, a life-like portrait was secured. This is, we believe, the first record of a living fish being secured, although at the Brighton Aquarium some attempts of a like nature have, we think, been made.

Movable Dark Rooms.—An exhibition of the various kinds of dark wagons or travelling laboratories employed by photographers would bring together a quaint collection of vehicles. We hardly believe there would be two alike in such a show, and the varied form and shape, as also size, of the dark room on wheels, would outdo the liveliest imagination. Photographers have usually as the end in in view, how best to reconcile to their peculiar uses any vehicle that may be handy, and thus we see perambulators, wheelbarrows, and all sorts of conveyances, converted to the photographer's purpose. But even when it is not a question of adaptation, and the photographer resolves upon the construction of a movable dark room—we do not speak just now of dark tents—the chances are that a very nondescript structure is evolved from his brain, for he is doubtless cleverer as an operator than as a carriage builder. So that it would be those vehicles, we think, which have been designed by the photographer himself which would be most ludicrous to look upon. We have in our eye at the present moment a finely finished little wagon on four wheels which was designed so as to be raised and lowered at will upon its platform, and of which the fittings were the most perfect of their kind. Indeed, the cost of constructing the little machine was no less than thirty-five pounds, and it was with some pride that the designer thereof beheld the smartly varnished vehicle pulled out of the yard for the first time. It was then found that the wheels locked, owing to a defect in the platform, and to turn a corner it became necessary to lift the carriage bodily round. When, further, the laboratory was filled, it was much too heavy to raise or lower without special means of doing so, and, as a fact, we know that the elegant little apparatus has not been used ten times in as many years. One dark room on wheels, we know of, looks suspiciously like a baker's cart, such as men wheel about the London streets, and it is said to be one of the handiest affairs of the kind; but a style much affected by country photographers is an oblong box, generally painted in bright colours, which is dragged along by a handle in front, and leads enquiring youngsters to ask, "Where's the monkey?" The army photographic wagon (such as is used at Chatham) is, perhaps, the smartest vehicle of the kind in existence: a light structure, fitted with orange glass windows and little green blinds, with the interior fitted with all sorts of handy cupboards and convenient little seats. Some gentlemen, who build their own dark vehicles, choose the bathing-machine pattern, as being both serviceable and simple; while others adopt the family perambulator to their uses. Perhaps the quaintest of all dark wagons is that employed at the present day at the Woolwich Photographic Establishment. Twenty years ago it was customary to employ convict labour at the Arsenal, and three hulks were moored in the river for berthing the men during the night. At daybreak they were landed in gangs, and, under the serveillance of armed warders, they worked on the wharves in shipping and unshipping the stores. To bring up detachments from time to time from London, a rough sort of prison van was employed, having no windows, but simply a couple of ventilators at the top, and, in this conveyance, ten or a dozen convicts were brought up at a time, and lodged in the hulks. Convict labour was dispensed with at Woolwich about the same time that photography got a footing there; and this dark, lugubrious vehicle at once proclaimed itself the very thing for a movable dark room. A cistern or keg of water found place on the wagon for the convicts when thirsty, and by making a hole in the roof, and leading through a rubber tube, the dark wagon was at once supplied with an abundance of water, so necessary to photographic purposes. The convicts have long since left Woolwich, and all that remains of them are some mounds of earth beyond the Proof Butts, which still mark their burying ground; but their old conveyance exists still, and is daily employed in encompassing deeds of darkness.

THE VALUE OF SILVER RESIDUES.

BY E. SCHMID, OF AARAU.*

Some conversation has recently occurred upon the question whether it is more profitable for the photographer to sell the residues that he may collect, or have them reworked in a laboratory, for his own benefit. The author, from an experience of ten years as a practical chemist, during which time he has been constantly engaged in working silver residues, has collected some information on the subject, and this he desires to lay before his readers, in the hope that it may help them to form an opinion upon the question in hand.

Let us, in the first instance, before going further into the matter, consider the actual value of the residues to be worked. According to the theoretical composition of chloride of silver, 100 grammes of dry chloride of silver should yield 75 grammes of metallic silver. This proportion, however, is never secured by the photographer, and we have placed, underneath, a tabulated statement of the theoretical and practical results of certain quantities of chloride of silver which have been worked in our laboratory.

	Chloride of Silver Grammes.	Yield of Metallic Silver.	Theoretical Contents.
1	295	190	217
2	560	385	420
3	410	195	307
4	605	380	453
5	1500	680	1125
6	480	260	360
7	690	465	517

It will be seen, by the comparison of the above, that the amount of silver yielded in practice amounts to from 12 to 40 per cent. below what the quantity should be in theory. The reason for this considerable deficiency is to be found in the circumstance that, unfortunately, photographers do not prepare their chloride of silver with the necessary care; some consider the matter beneath them, and others have no knowledge of how they should go to work. Very often foreign matter which has the appearance of chloride is mixed with the same, and then, of course, when the mass comes to be reduced, the expected result is not attained.

The theoretical value of chloride of silver may be taken at 160 marks per kilogramme (eighty shillings a pound), whereas its actual worth, according to the above statement, is shown to sink as low as 73 marks per kilogramme (thirty-six shillings and sixpence a pound).

More variable still than the residues is the value of paper cuttings. The greater the quantity of unfixed cuttings and silver filter papers there are present, the greater will be the amount of silver yielded. Cuttings from fixed prints are often nearly valueless. The following table shows us a statement of the results of the reduction of ashes from paper cuttings:—

	Ashes, in grammes.	Metallic Silver, in grammes.	Percentage of Silver in the Ash
1	3750	1302	37·7
2	770	235	30·5
3	1250	500	40
4	1220	730	59·8
5	1720	855	49·7
6	760	30	3·9
7	400	45	11·2
8	1050	110	10·5

From 1 to 5, the lots of ashes had been derived from unfixed cuttings, and these, it will be seen, contained a percentage from 30·5 to 59·8 of silver, showing a variation of 29·3 per cent. The ashes from lots 6 to 8 were derived from fixed cuttings, and these yielded from 3·9 to 11·2 per cent. of silver, showing a variation of 7·3 per cent. Ashes like those represented by lot No. 6 do not pay to work, as the cost of working is higher than the silver obtained.

Now that we have considered this difference in value of the various residues, we will proceed to the real question in hand. The photographer gives over his residues to the chemist, who supplies him with most of his materials, to be reduced, and then has its value written to his credit, or receives a corresponding quantity of nitrate of silver. Under these circumstances the chemist or manufacturer is contented with a moderate fee for his work, and the way he usually proceeds to secure payment is as follows:—From the value of the silver, reckoned at eighty shillings a pound, he takes for himself, in the case of large quantities, two shillings per pound, or in small quantities, four shillings per pound, together with the value of his labour, reckoned at cost price; so that in reality the photographer has seventy-two to seventy-four shillings for every pound of silver recovered.

To convince ourselves that the price usually paid for residues was a fair and reasonable one, we purchased, some time ago, several lots of residues at the prices usually paid by German houses. The results of the transaction were as follows:—

No. 1.—We paid for 16lb. of paper cuttings, at three shillings and threepence, the sum of fifty-two shillings. From this we obtained, on burning, 800 grammes of ash, and, finally, 490 grammes of metallic silver; and this, reckoned at the rate of seventy-three shillings a pound (taking into consideration cost of labour), may be valued at seventy-one shillings and sixpence.

In this case the photographer, when paid three shillings and threepence per pound for his cuttings, received at the rate only of fifty-three shillings a pound for metallic silver, and suffered, therefore, a loss of nearly twenty shillings; in other words, he should have been paid one shilling and twopence per pound more for his cuttings.

No. 2.—Six pounds of paper cuttings were purchased at four shillings a pound, or twenty-four shillings. This yielded metallic silver estimated at thirty-six shillings and ninepence (after deducting cost of conversion). In this case the photographer lost at the rate of twenty-five shillings on every pound of silver, or two and three-halfpence per pound on his cuttings.

No. 3.—Twenty-eight pounds of cuttings were purchased at two shillings and ninepence per pound, or seventy-seven shillings. The result was 1,720 grammes of ashes, and 855 grammes of metallic silver, reckoned as worth one hundred and twenty-six shillings and sixpence. In this case the photographer lost at the rate of one and ninepence per pound on his cuttings, or nearly thirty-four shillings per pound on the metallic silver.

No. 4.—Six hundred and twenty-five grammes of chloride of silver were purchased at the rate of forty-eight shillings a pound, or sixty shillings. The result was 410 grammes of metallic silver, which, reckoned at seventy-three shillings a pound, makes nearly sixty shillings. The value of metallic silver from this chloride being seventy-four shillings a pound, in this case one-and-ninepence per pound too much was paid for the chloride.

No. 5.—Six hundred and ninety grammes of chloride of silver were purchased at fifty shillings a pound, or sixty-nine shillings. The value of metallic silver from this chloride being eighty-one shillings per pound, four-and-sixpence per pound too much was paid in this instance for the chloride.

All the paper cuttings purchased up to this date have given similar results to the above, with the exception of two, which yielded a negative result to the extent of one or two shillings. As regards chloride residues, the two examples above given are the most unfavourable that have come under my notice, for, as a rule, it yields a profit of from eighteenpence to two shillings per pound of metallic silver recovered.

Summarising our results, we find that the purchase of photographic residues by experienced manufacturers is a very profitable business. They pay with a considerable degree of strictness for the amount of metal recovered from the chloride, but generally make a profit of from 30 to 60 per cent. upon paper cuttings. This is our experience, as also that of the owners of the waste products themselves.

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* *Photographische Mittheilungen.*

In conclusion, as regards the question whether it is more profitable for the photographer to sell his residues, or have them re-worked at his own cost, we would say this: for those photographers who have sufficient chemical knowledge to test the value of their products, it is immaterial whether they adopt one course or the other, as they know very well in either case what the value of the residue is. The greater number of photographers, who do not possess the requisite chemical knowledge, should not sell their residues, as they then embark in a speculation about which they know nothing The working of photographic residues for the owner is, it is true, perhaps one of the most disagreeable tasks that anyone can undertake, as it often leads to dispute about the real value of the metal recovered. At the same time there are enough houses to be found who will act justly by their customers in the matter.

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PHOTOGRAPHS OF THE INVISIBLE.

BY CARL MYERS.

So many inquiries have been made by persons evidently seeking truth, regarding the possibilities or probabilities of spirit photography, that I am tempted to contribute some of the results of my own experience in such researches for general information to those whose interest or occupation deny them practical investigation of the subject. The leisure of several years' practice of the photographic art I have devoted to independent photographic investigation, with considerable success, and it is natural that I should have felt much interest in anything so conspicuous as the claims of spirit photography.

In the pursuit of these investigations, I constructed a room capable of being made perfectly dark, into which variously qualified lights were admitted, usually through the medium of a large condensing lens, which concentrated all the entering light to a fine point, where it was disintegrated, and then spread out to fill the room with light of any desired character. Among other experiments performed, was that of making photographic likenesses in this room while perfectly dark, or at least so dark to the human eye as to render all objects invisible, the person sitting not perceiving just when his portrait was taken, though directly facing the camera.

I thus satisfied myself that invisible beings could have their portraits photographed. Theoretically this same belief is universal among optical scientists, and based upon knowledge of the actinic properties of the invisible rays of the solar spectrum; but, so far as I can learn, I am the first to practically demonstrate the feasibility of invisible portraiture. Putting this with the fact that visible objects, material or immaterial, can have their likenesses taken if posed before the sensitive plate in the camera, within range and focal distance, leaves spirit photography inferentially possible under suitable conditions, but still undemonstrated. Extended efforts to furnish suitable "conditions," according to the best spiritualistic authority, have failed to afford me any actual proof of spirit photography. I say "actual proof," because such proof can only be obtained by the artist himself, as I am convinced by many experiments that no one except the artist engaged can detect the many methods by which such apparent results can be obtained. Spirit pictures are usually exhibited as prima-facie evidence of their own genuineness, which is obviously absurd, and it is my intention here to explain several methods, partly original and partly already known, by which such apparent results may be obtained, the results being scarcely prima-facie evidence of genuineness, though otherwise satisfactory.

As regards the artistic quality of the pictures often offered as evidence, all of the many that I have seen are a disgrace to the noble art whose title should be "Recorder of the Sciences." As authentic likenesses, they would not endanger a criminal if exhibited in a spiritual rogues' gallery, to assist in identification, and, while claiming significance as photographic art productions, they outrage every law of perspective and chiaroscuro. It will be remembered, by both critics and sensitive people, that in making this statement I am merely exercising my just right as an artist, regarding the things I have seen, and that I am constantly desirous of enlarging my opportunities for observation of anything pertaining to my art.

The most fruitful field for observation of queer appearances is the photographic apprenticeship. The chemical ignorance and incompetency of the beginner result in streaks, stains, blotches, and clouds, many of which have suggested resemblances to the human figure, and all of which ghosts are laid by the master's touch, because he has learned their simple cause and remedy. Dirty plates are very common causes, and the slightest finger-mark on the surface of a chemically clean plate makes a "dirty plate" of it. Under this head come the cases occurring where once used plates are used over again after cleaning off the original picture. Such plates, after cleaning, exhibit no signs of being "second hand" until chemically developed, when the original picture is liable, under some conditions, to show itself anew, either in whole or in part. Such plates are bought and sold among photographers, and needy artists oftentimes use their plates over and over again. The mention of these facts will sufficiently indicate the possibility that an artist may sometimes innocently impose upon himself or his patrons.

When the artist has motives for deception, a host of methods offer their various advantages. The simplest consists in soiling the plate by marking any invisible design upon its clean surface with the finger, or otherwise, which invisible design appears upon development of the plate. Another method consists in the selection of glass of soft quality, treating it with strong solutions to dissolve its surface and "honey-comb" its interior with microscopic crevices, and then making any desirable picture upon it. The picture may be finished and then rubbed off the glass so as to defy the closest scrutiny. But when a new picture is made upon the plate, the old one inevitably reappears, usually fainter. A modification of this method is equally applicable to ferrotypes.

If actually clean plates are used, fraud may be practised by suitably placing transparencies of any desirable figures either in the camera box or plate holder, the image being developed with that of the person actually sitting. A lens and picture microscopically small may be so placed in the camera, and still serve its purpose and escape detection. A minute pin-hole in the camera front serves as such a lens to picture any object at any distance in front of it about the room. Also, the usual exposure of a really clean plate may be made, and the desirable figure then added by holding the negative against another negative or transparency while exposed for a moment close to the lamp often used to light the dark room.

Another method possible of practice, is that of confederacy, where the personating assistant steps for a moment behind the sitter, and is thus faintly imaged. A "medium" may also obtain the portrait of his double by sitting before the camera half a minute, then rising and standing beside his former position for a few seconds—the developed plate revealing his double standing beside himself. A variation of this trick may be played without the sitter's knowledge by the artist moving the camera slightly just before the exposure is concluded, when the head and shoulders of the sitter are faintly outlined behind the distinct image.

Various substances capable of reflecting only the invisible or violet-coloured rays of sunlight may be used to paint an invisible picture on the background behind the sitter, which becomes apparent upon development of the exposed plate.

I will mention here a method which I believe I am the first to announce. A magic lantern illuminated by condensed sunshine, like the solar microscope, or by burning magnesium, the electric or the lime light, or any other affording chemical rays, casts the image of any one or more desired objects on the background; but before leaving the lantern, the rays of light are rendered practically invisible in daylight by passing them through the same medium used when "making portraits in the dark," this medium being capable of absorbing the illuminating rays, but permitting the invisible chemical rays to be projected on the background or the sitter through an orifice practically unobservable, and only recognisable by the eye of the camera and its sensitive plate. The entire apparatus used need not be so large as a common brick, and is capable of exhibiting, without possibility of detection, anything put into it—the developed plate being the first proof of its existence. Operators familiar with the marvellous powers and capacities of the modern magic lantern will at once appreciate this revelation. I am not actually aware that this method is practised, but I know that this and other methods are perfectly practicable, and that only the artist can know if he practises them.

Experiments satisfy me that there is another method superior to all these, but I omit description of it here because, to any other than myself, it might seem equally as preposterous as spirit photography, and I do not wish to cast doubt upon my previous statements by additional ones that I will not willingly demonstrate; so I pass on to photographic printing. In this field, by a skilled operator, almost any desirable effect can be obtained through the modern system of retouching, masking, and double printing; and if the distinct images apparent in all I have seen are the only ones demanded, the likeness may be identified by any trusting person, who is bound to feel convinced. By such methods as these can be furnished by wholesale the floods of so-called spirit photographs forwarded in our mails in response to letters containing the customary fee.

After these revelations it may be inquired if I consider the question of the possibility or impossibility of spirit photography decided. Not by any means. I only give this information for the benefit of those who have not got it, that it may assist them to a better understanding of the subject, that the believing spiritualist may know that there are means adequate to produce such apparent pictures, and that the scoffing sceptic may check his sneers by the discovery that invisible objects can reveal themselves in the camera. In fact, I have no hesitation in asserting that the beings or objects which we see posed before the camera are not the originators of the photographic image, but only visible accompaniments of the comparatively invisible surfaces which reflect the invisible rays of chemical light!

The facts of spiritualism may prove spirit photography, but such apparent productions do not prove spiritualism. My own position is that of an unprejudiced investigator who has discovered enough to make him cautious as to assertions, while seeking to know more for science's sake. I am inspired by no faith, but by desire for knowledge. I seek conviction, not conversion, and in this position I offer no technical testimony in response to the clamours of spiritualists that science should investigate its assumed phenomena, and declare upon its merits. In pursuance of this investigation I will afford every reasonable facility for demonstration of spirit photography, even to photographic instruction of those who otherwise consider themselves qualified for success, but lack opportunity.

ART IN PHOTOGRAPHY.

I HAVE a small, but very respectable business in a part of the country much frequented by visitors, employing myself, an assistant, and a young lady in my showroom. Having a proper ambition, I have taken great pains to succeed in touching up negatives, and, until the following circumstances, congratulated myself on turning out work which is called first-rate.

One day, I had just showed some untouched proofs to an elderly lady and gentleman. They were much pleased, and had ordered freely from them. After they had gone, another gentleman came in. I recognised him as a professional painter, an exceedingly pleasant and agreeable man. After the usual greetings, he came to the table, and took up the gentleman's proofs.

Artist.—"What a grand old head."

Photographer.—"Yes; when it is touched up, I think it will make a fine portrait."

Artist.—"How, touched up? Why, it is perfect."

Photographer.—"I mean to subdue the lines, shadows, wrinkles, and markings in the face."

Artist.—"Why, you don't mean to say you are going to rob that magnificent face of its grandeur?"

Photographer.—"No, I am going to add to its beauty—make it smooth."

Artist.—"My dear sir, you mean to destroy in five minutes what it takes us artists years—I may say, a lifetime—to delineate. I like your style, the light and shade, the general clean quality is first-rate; but, excuse the expression, the bladder-of-lard effect is entirely wrong. What time can I come to-morrow to have my wife, daughter, and self taken?"

Photographer.—"Eleven o'clock."

Artist.—"Then we will be here. Good morning!"

On the morrow, I certainly found them all easy to take; in fact, most delightful to talk to, and ready to fall in with my suggestions. Strong light and shade was required. The gentleman required a large head, not vignetted; smaller ones, vignetted, for his wife and daughter. Next morning, they were pleased with the proofs. The artist said—"If you touch a single hair of my head, or mark on my face, there will be a row! They are the indications of thought, of study, and anxiety. Do you think I want people to have an idea that I am a man without any of these? It is the glory of a man. Look at Longfellow's or Tennyson's face! Every line, every wrinkle, indicates to some one or other of his inward feelings."

The two ladies were anxious to be made pretty. Here was a dilemma. Turning to the artist, I said, "Well, what is to be done now?"

Artist.—"Well, the young lady's is all right, except a little irregularity caused, I suppose, by the freckles, and you might soften the line on the brow; but don't attempt to make it look polished. To my wife's, tone down the shadows at the corners of the mouth and the lines generally, but don't remove them; a little roughness is rather agreeable than otherwise."

Photographer.—"You don't seem to have a very good opinion of photography?"

Artist.—"Yes, indeed, I have; but, I think, if photographers had a little more artistic training, it would give the art a better position, and, from what I see, it is fast gaining that position. There are some men amongst you that are really an ornament to the profession, and I wonder what painter is without those gems of art by poor Rejlander. He is, indeed, a loss severely felt by us. I should like you to see his portrait. You would find plenty of lines of thought and refinement there."

Photographer.—"I have a son just about to leave school. Do you think it better that he should learn drawing, as I intend taking him in the business?"

Artist.—"Certainly. If possible, let him attend a school of art nightly. He may perhaps not become anything of a draughtsman, or he may become clever; in any case, it will teach him to discriminate outline and form; and if he get so far as to draw from the cast, nothing can educate the eye more for light and shade. He will become somewhat of a judge of pictures, and if he attends exhibitions, they will give him more real pleasure. It is a great age for pictures, and I have no doubt photography has done much in this respect. Do you take any illustrated paper?"

Photographer.—" No, I don't."

Artist.—" But you see them?"

Photographer.—" No, I don't."

Artist.—" Well, I am surprised. Nothing gives me more pleasure than looking through the *Illustrated London News*, *Graphic*, and *Punch*."

Photographer.—" Oh! I sometimes see *Judy* or *Fun*."

Artist.—" Yes, they are very well in their way; but they are vulgar compared with *Punch*. All these well illustrated works have a tendency to elevate the mind. And then, again, how beautifully the children's books are illustrated! And the *British Workman!* In fact, well drawn and beautiful illustrations, seem to be the order of the day."

Photographer.—" Well, I find that my customers are more critical than they used to be; in fact, they quite bother me with their technical terms, &c."

Artist.—" Yes, that is art education of the masses; it is a healthy and proper feeling, and photographers should do all they can to cater for the people by producing good and artistic work, and that is only to be done by art knowledge."

Photographer.—" Photographic exhibitions don't seem to succeed anywhere but in London, and exhibitions of paintings seem to pay anywhere. How do you account for that?"

Artist.—" For many reasons, it is most difficult in photography to battle with nature—it seems to crop up everywhere too strong. An artist, when he paints a picture, not only copies Nature, but he puts his feelings on his canvas or paper, and can introduce or leave out as he likes. And, amongst many other reasons, the commission on the sale of pictures at an exhibition comes to a large item to defray the expenses."

Photographer.—" Do you think that the present generation of painters are equal to the Old Masters?"

Artist.—" Yes, quite, in some things; very much superior in landscapes, but not equal in figures. I don't think their drawing is so good, nor their anatomical knowledge so perfect, although we have some very grand painters now. There is one thing certain: artists get better paid, and there is more money spent in modern pictures than ever; that, again, shows the desire for good art work. I am afraid that you are tired of my lecture, so I will wish you good morning!"

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Recent Patents.

WHITE PLATES FOR PHOTOGRAPHS.

BY H. M. HEDDEN AND C. A. HILL.

The following specification describes the mode of preparing the white plates used with collodio-chloride of silver in producing the photographs known in America as "Albatype" or "Nonpariel" pictures:—

This invention consists in the production of white photograph plates, other than those of porcelain, iron, or glass, and white surfaces to be used in photographic printing. And I now proceed to describe one mode of making these new plates, as follows:—I prefer to take the well-known ferrotype plates, which are made of thin sheet iron, covered with an elastic coating of baked linseed oil for the backing, and upon which to produce the white surface; but other metallic plates, cardboard, leather, wood, and many different materials, may be used for this purpose. I make a compound, first, of alcohol, two and a half ounces; ether, two and a half ounces; gun-cotton, thirty grains; and white oxide of zinc, three hundred grains. Put the gun-cotton into a bottle, add the alcohol, and after the cotton has soaked a few minutes, add about three-fourths of the ether, and shake the mixture until the cotton has dissolved, then add the remaining portion of ether, and shake well. Put the oxide of zinc in a clean dry mortar, and after pulverizing it, add about one-fourth part of the collodion—made as above described—to it; stir the oxide of zinc and the collodion together, until a smooth creamy paste is obtained, then add the remainder of the collodion, at the same time stirring with the pestle; allow the compound thus prepared, and which I call the enamel, to settle a minute, and then decant four ounces into a bottle ready for use. When about to use the enamel, shake the bottle containing it thoroughly; allow it to settle for ten minutes, and then fill a smaller bottle with it, from which to flow the plates. Pour this enamel upon the ferrotype plates, or other surfaces, precisely as ordinary collodion would be applied to them by photographers, keeping the plates in slow motion, causing the enamel to flow, and spread evenly. About one minute after the enamel coating has ceased to flow, place the plates in soft water for ten minutes, and then in running water, under an open water faucet, for ten minutes longer; then immerse them, while still wet, in the following solution, which I call the sizing:—Water, eight ounces; gelatine (Cox's preferred), forty grains; arrowroot, forty grains; and sugar-candy, eighty grains. Put the gelatine in two ounces of the water to soak for one hour, then apply gentle heat until it is all dissolved; boil the arrowroot in six ounces of the water, and mix these two solutions together while warm; then add the candy, and dissolve it in the mixed solutions of gelatine and arrowroot. The enamel plates should be allowed to remain in this sizing solution for about ten minutes; they are then removed and dried. This completes the mode of manufacture, and the plates are now ready for use or sale.

Although the process has been described as a continuous one, it essentially consists of two parts, the preparing of the plate with a coat of enamel, and, secondly, the sizing of the plate so prepared. The plates may be prepared and dried before subjecting them to the sizing process, but the process described is found to answer best. I have thus given one way of making the white plates, which have been found to produce excellent results, but I do not confine the process to the particular materials named in this formula, nor to this particular method, neither to the pigment, vehicle, medium, enamel, sizing, nor to the proportions named, which may be slightly modified without departing from the spirit of the invention.

Previous to this discovery white photograph plates, excepting those made of glass, porcelain, ivory, and bone, were not known in the arts, or as articles of commerce, and I therefore claim as the invention,—

Firstly. These new articles of manufacture, namely, white photograph plates prepared substantially as described.

And, secondly, the combination of such plates with a sizing, substantially as described.

STAND FOR EXHIBITING PHOTOGRAPHIC PICTURES.

BY J. F. KNIP.

The following specification describes a stand for photographs. The patent was not completed.

My invention relates to an improved stand with holder and frames for exhibiting cartes-de-visite and other photographic pictures.

The holder is composed of metal mounted to revolve on a vertical pivot fixed on a suitable pedestal or stand. The holder consists of a top and bottom plate or disc, between which are pivoted a number of frames, leaves, or clips, disposed radially around the central pivot in which the pictures to be viewed are placed. These frames may either be of metal or other substance, or they may be leaves of cardboard similar to the leaves of a photographic album, in which case they would be fixed in a metal clip pivoted at top and bottom in the revolving holder. In their normal position these frames or leaves radiate from the central pivot on which the holder revolves, and they are thus held by notches or undulations in one of the discs or plates of the revolving holder, into which they are pressed by springs on their opposite pivots. These spring and notches serve to hold the frames in the radial or in any other position in which they may be set—whilst the entire holder is revolved, for instance—and yet admit of any two adjacent frames or leaves being separated or opened out like the leaves of an album or book to view the pictures clearly.

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SILVERED PAPER FOR PHOTOMETRICAL PURPOSES.

THE interesting paper read by Captain Abney on Tuesday night, on a Method of Measuring the Diurnal Photographic Intensity of Daylight, and the brief discussion which followed, suggests a few reflections on the nature of the sensitive surface used to secure the record in such photometrical observations. We need not here enter into any description of the ingenious mechanical appliances which Captain Abney exhibited and described, and of which details will be given in our next. Our business is solely with the sensitive surface employed in registering the varying intensity of the light. Captain Abney has employed a standard paper similar to that used by Professor Roscoe, with whom the mode in question of measuring the chemical intensity of light originated. Notwithstanding the careful experiment as to the varying sensitiveness of samples of paper prepared with varying formulæ and conditions, which preceded Professor Roscoe's choice of a standard paper, we cannot help thinking that certain elements of variability and uncertainty remain inevitably in the standard paper, and Captain Abney's statement that such papers become rapidly discoloured, being very sensibly injured within two days, is in itself sufficient evidence that a steadily progressive change is going forward in the surface, independent of the action of light; a change which must seriously vitiate the value of the registration as a record of the action of light.

Something like a dozen years ago Professor Roscoe read a paper on this subject before the British Association assembled at Bath, and in a conversation at the close of the meeting we ventured to suggest to the learned Professor that the varying quantity and quality of organic matter; the varying condition of the nitrate bath after each sheet was excited, leaving present a varying quantity of free nitrate of silver; the varying temperature, as affecting the spontaneous reduction of the silver, must all materially affect the sensitive surface, and render its record of the action of sunlight uncertain and untrustworthy. Admitting the force of these objections, Professor Roscoe said that the result of many experiments had enabled him to minimize these difficulties. He had found that the strength of the silver solution did not materially affect the question, and that a paper yielding a tolerably uniform result for one day's keeping might be prepared. A suggestion, which we then made, as to the desirability of preparing chloride of silver free from excess of nitrate in an inert vehicle, received Professor Roscoe's hearty concurrence, if such a vehicle could be found; and this led, as we have before stated, to the experiments which issued in our discovery of the collodio-chloride of silver process, which we think affords facilities for securing accurate photometric records much superior to any which the ordinary mode of salting and exciting paper on a silver bath can possibly afford.

A question which was asked in the brief discussion which followed Captain Abney's paper, suggests another point in connection with sensitive surfaces for photometric purposes. Mr. Spiller asked if Captain Abney had tried carbon tissue in the course of his experiments. It should, we think, be a condition recognized at the outset, that in all photometrical experiments the record should be obtained direct, without the aid of secondary processes. In every form of development the result may be modified by the manipulations in development, and short and long exposures be made to approximate in result. In carbon printing this is pre-eminently the case. Prolonged soaking, increased temperature, and other varying conditions not entirely within control, very materially affect the depth and quality of the tint obtained. Varying qualities of gelatine, the age of the tissue, the humidity of the atmosphere, and other causes, are not less active in modifying results, sufficiently to vitiate their value in such observations, and to render carbon tissue more than usually unfit for the purpose.

It is probable that some of the samples of permanent sensitive paper, or paper prepared on a similar principle, would approach most nearly of any surface prepared by means of a nitrate bath. Carriere paper, or a paper of the same stamp, would probably be found to answer fairly, as it is found to serve well in the practical actinometers used in carbon printing. Professor Roscoe's standard paper itself would probably be improved by washing to remove the free nitrate of silver. At any rate, it is clear that in a paper in which discolouration is seen in two days there must be sufficient spontaneous reduction of silver to modify results; and as this spontaneous reduction must vary with the heat of the weather, this modification must be of a variable kind, and so vitiate results. A film of collodio-chloride of silver, or collodio-bromide of silver, prepared with a collodion forming no organic compound with silver, would, however, give results most free from varying conditions, and so tend to make such records trustworthy, by being exact.

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MAKING A BATH AS GOOD AS OLD.

MR. SHERMAN, in describing his method of renovating a bath, repudiates the notion of making it "as good as new;" he aims at something which he regards as better still, his object being to make it as good as an old bath in fine working condition. In an article contributed to last *Mosaics* he says:—

"'Dry up on the old bath,' says one. 'Boil the old bath,' suggests another. 'Evaporate to dryness,' counsels the third. 'Evaporate and fuse,' urges the fourth. 'Precipitate with salt,' ejaculates the fifth. Do nothing of the kind, say I to each of these specifications. The old bath can be used to better advantage than in either of the ways enumerated. This is my reason for disregarding the first of the above recommendations."

After referring to the remote period when an emulsion process may possibly supersede the use of the nitrate bath, and the necessity—at present, at least—for mastering the management of the nitrate bath, he proceeds:—

"Last year I had the honour of contributing to the *Mosaics* an article entitled 'A Negative Bath Three Years Old,' and to this time I do not know that it has elicited a single adverse criticism; from which it may be fair to presume that it has not been considered of sufficient importance to justify a trial of the process described. Having now used it another year with great satisfaction, I can think of nothing to offer that would be likely to be of greater service to the craft than another chapter on the same subject.

"It has often been said by experienced photographers—if, indeed, it has not come to be a generally admitted fact—that an old bath, when it has nearly reached the point of becoming unmanageable, produces some of its finest negatives. Suppose, now, that it could be kept in this peculiar condition of ripeness, so to speak, and even grow better by age. This is just what I claim to have done. My experience extends over more than four years, during which time the same solution (replenished, of course, as occasion required) has been in daily use without any boiling, evaporating by heat, or fusing. It has not even been sunned during the last year; neither has it for the same length of time been de-iodized, both of which I previously supposed to be required. I have served a long apprenticeship at bath making and using, but never had one to compare with this. Then consider what it is to have a bath working year after year with perfect uniformity. When pin-holes make their appearance, all that is required is to filter. Doubtless it may seem incredible that the ether and alcohol should not make the trouble usually charged to their account. This, to me, is no more surprising than that the bath does not require to be rid of iodide, which has always, heretofore, seemed as necessary to remove as the ether and alcohol. But the facts are as stated. The explanation of the reason why must here be omitted.

"I will now describe my process of treating an old bath, by which it may be made, not as 'good as new,' but better; that is, as good as old.

"1. Filter the old bath into a bottle; add silver, if necessary, until it is forty grains strong.

"2. Add an excess of cyanide of potassium (about one grain to each ounce of silver nitrate is sufficient); shake thoroughly until no more cyanide of silver will dissolve; let settle; decant the clear liquid, and filter the residue.

"3. Add three fluid drachms No. 8 acetic acid to each quart of solution.

"4. Neutralize with bicarbonate of soda, and set in the sun until it settles clear. Filter.

"5. Add pure nitric acid, beginning with one-half fluid drachm to the gallon, until all tendency to fog is removed.

"When more bath is needed, proceed in the same manner with the new; after having dissolved the silver and iodized it as usual, add the new to the old, and your experience will be different from mine if you do not find it better than a new bath.

"The composition of this bath is peculiar. The addition of the cyanide alone causes matt silver stains in abundance; then after adding the acetic acid the most intense fogging will follow. The next step is also remarkable, for in neutralizing the acetic acid a considerable quantity of acetate of soda is introduced, the usual result of which would be precipitation of acetate of silver. Instead of this, a double salt is probably formed, more soluble than acetate of silver. Finally, the addition of nitric acid liberates a portion of acetic acid, and forms nitrate of soda.

"The developer which I use with this bath, and recommend, is composed as follows:—

Protosulphate of iron...	... 4 ounces
Acetic acid No. 8 ...	... 10 fluid ounces
Alcohol...	... 4 „
Water	... 2 quarts.

FRENCH CORRESPONDENCE.

Daguerreotypes of Pekin and Island of St. Paul—Monckhoven's Tartaric Acid Developer for Dense Pictures—Davanne's New Developer—Ducos de Hauron's Photo-chromic Process—The Paris Exhibition.

At the meeting of the French Photographic Society, which was held on Friday last, May 5th, some pictures taken at Pekin and at the Island of St. Paul, by photographers despatched to observe the Transit of Venus, attracted much attention. M. Davanne, who had obtained these pictures from M. Fizeau, gave some details of the manner in which they had been taken. They were secured upon Daguerreotype plates, prepared and sensitized the eve before their employment; they were treated with bromide of lime immediately before use, and then exposed. Immediately after they had been taken from the camera, they were put into a box with grooves, capable of containing forty plates at a time, and in this way exposed to the vapour of mercury. After a sufficient sojourn in this box, they were transferred to another, which served to transport them back to France; and it was only on their return that they were fixed and completed.

An amateur, M. le Comte d'Heliand, again called attention to a formula for development published by Dr. Van Monckhoven about fifteen years ago. It consisted of a mixture of tartaric acid with the iron developer. M. Heliand having had to produce some very black drawings upon white ground, and being unable to succeed to his wish, conceived the idea of trying the process in question. The developer at once gave him what he wanted, and permitted him to obtain very brilliant contrasts in his negatives. His developer was made up of:—

Water	...1000 cub. cents.
Tartaric acid ...	... 8 grammes
Sulphate of iron ...	... 50 „
Alcohol	... 30 „

This formula may be especially recommended to those who make the reproduction of engravings their special work, for it permits them to secure the most vivid contrasts.

In this connection, M. Davanne mentioned the advantages to be derived from employing as an intensifier the monosulphide of sodium in producing negatives of this kind. A photographer, who was present at the meeting, mentioned that for such negatives he had employed with great success a solution of iodide of potassium saturated with bichloride of mercury. This mixture is applied to the film until a red precipitate is formed, which soon redissolves. After having commenced intensifying with this mixture, you continue (in full daylight this time) by means of pyrogallic acid. It often happens to photographers who travel, that they run short of chemicals during their journey, and are at a loss where to go to obtain fresh supplies. For this reason it is sometimes convenient to substitute one material for another in making up a formula. M. Davanne has occupied himself for some time with this subject, and has now made a step of progress in the matter. Alkaline development, which presents numerous advantages, is now-a-days very frequently employed, but it may happen sometimes on a journey that the photographer lacks carbonate of ammonia. In such an emergency, M. Davanne tells us that we may without inconvenience employ a substance which he designates as saccharate of lime. Lime, which is to be found everywhere, is taken, and a solution of the following mixture is made up:—

Water	... 100 grammes
Sugar	... 10 „
Lime sufficient for saturation.	

A precipitate is formed in the first place, but after the liquid has stood for some time, it becomes perfectly pure. When you desire to proceed to development, there is added one decigramme of bromide of potassium (one gramme per litre), developing in the ordinary manner. Not only is the ordinary formula in this way satisfactorily replaced, but the change permits one to decrease to a considerable degree the time of exposure. M. Davanne developed in this way before the members of the society some negatives taken upon collodio-albumen (the Taupenot method), which had been exposed for two minutes instead of four, and which succeeded admirably. We possess, therefore, in this method of M. Davanne, not only a convenient resource which may be substituted in case of accident, but an improvement actually in the old method of development, which is accelerated thereby.

M. Ducos du Hauron exhibited at the meeting several pictures obtained by his heliochromic method, which we have already described in these columns. The new specimens were a portrait (reproduced from a painting), a landscape from nature, and a sea view. The latter was shown mounted upon cardboard, and also as a transparency upon glass. The coloured portrait was in the same frame with these pellicle images, red, yellow, and blue, which by superposition had gone to produce the finished picture. The images, which were of much larger dimensions than those hitherto shown by the inventor, prove that M. Ducos du Hauron has made some progress with his method. The colours are purer, the tints more correct, and the period of exposure given was far less than at first required. The pose has been reduced; indeed, it is said, to a quarter of an hour. These are, therefore, most encouraging results, and if the process cannot yet be worked industriously, there is every reason to hope that if the author continues to work with the same perseverance and success, the method will soon be capable of being practically carried out for ordinary purposes.

The annual exhibition of the French Photographic Society was opened on the 1st of May, at the *Palais de l'Industrie*, and although the collection has not yet been completed, we may assure our readers that it is a most interesting one. The number of exhibitors is limited; our provincial photographers especially have this time displayed much indifference in the affair, but foreign photographers have, we are glad to see, responded to the invitation given, and have sent some interesting specimens of a special nature to the exhibition. There is to be seen, side by side, the productions emanating from the *Depot des Fortifications*, from the *Comite Centrale de l'Artillerie*, from the office of the Minister of Public Instruction, as also photographs secured during the Transit of Venus taken by apparatus specially constructed for the purpose. The apparatus and photographs furnished by the Government departments occupy one special room by themselves of the little pavilion set apart this year for the Paris Photographic Exhibition. The greater part of the prints exhibited have been produced by the carbon process or greasy ink method. This is the feature that particularly strikes the visitor on entering the exhibition, and it is impossible not to acknowledge at once the great step of progress which has been made in these processes during the past year. Photo-chromie alone occupies two panels, the numerous examples demonstrating the great variety of its applications. We shall come back to the subject of the exhibition in our next letter, when we propose to give such details respecting it as may prove interesting to the readers of the Photographic News.

Ernest Lacan.

PRACTICAL NOTES ON CARBON PRINTING.

BY TH. HONIKEL.*

1.—After the tissue has been sensitized upon the bichromate bath, it must not be pressed too firmly against the glass plate upon which it is laid, otherwise defective parts are produced. As, however, this pressing out of moisture is beneficial, both because the tissue dries faster and assumes a finer surface, I prefer pressing it by means of a polished zinc plate, put equally over the surface.

2.—The tissue dries best if the upper margin is clasped between two thin laths by means of clips, and if the laths have been waxed the tissue will not adhere to them when dry.

3.—The actinometer may be advantageously covered with a very pale yellow glass, so that the silver paper underneath is longer in printing, for tints are much more distinguishable in a light than in a dark impression. My actinometer has inside a movable roller which may be pushed on one side; upon this the paper is easily fixed, permitting a hundred exposures to be given.

4.—Carbon tissue prints comparatively quicker in dull weather than in bright light or sunshine; that is to say, a print is of a darker tone if produced by slow printing, than one which has been brought to the same pitch, judging by the actinometer, quickly, in a bright light.

5.—To the collodion serving as development basis may be added with advantage a small quantity of negative varnish, as much as it will stand without becoming milky in the water bath. In this way a more stable and firmer film is produced, and one, moreover, which easily quits the glass at the end of the operation.

6.—For transparent positives it is best not to employ any substratum at all; the glass may be polished and coated with albumen, as in the negative process, however, without any fear of the image leaving the glass.

7.—The best materials to develop upon for ordinary work are fine matt glass and polished zinc. The trimming, mounting, pressing, and retouching of the pictures are the same as in the case of silver prints, only the operations must be performed with a little more care. As regards vigour, tone, glaze, and appearance, carbon prints may be secured quite similar to albumenized pictures. Silver and carbon prints are, indeed, often very difficult to distinguish.

8.—In large pictures developed slowly at a low temperature, a material influence may be exercised upon the tints of the background, drapery, and high lights, by the judicious application of a stream of lukewarm water applied by hand.

9.—Chrome-alum solution I employ always in a concentrated form. I pour it but once over the image, allow the liquid to remain upon the plate, held in a horizontal position, for a short time, and then rinse with water.

10.—In developing direct upon paper the waterproof solution of borax, shellac, and soda should be made up with shellac of a reddish-brown tone; it imparts to the paper a pleasant rosy tint similar to that seen of rose-coloured albumenized paper.

11.—More than two rows of small pictures should not be developed upon one basis, as prints at the margin of the plate, whose vigour requires to be corrected by the aid of a warm water stream, can be easily treated; whereas if there is a middle row of images, these are only dealt with with difficulty.

12.—Pictures are more difficult to remove from glass, especially patent plate, when dried rapidly.

13.—In the case of pictures having a high gloss, when these are half dry, a two- or three-sheet moist cardboard is attached by means of good fresh paste, and upon this is put a sheet of moistened paper, the whole being covered for some time by another glass plate kept down by a moderate weight.

WHAT IS ACTINISM?—SOME CURIOUS FACTS.*

Actinism is the chemical power which is necessary to excite germination in plants. It emanates from the blue ray of the spectrum, and is the same power which operates on the sensitive silver in photography—photography being, by the way, an entire misnomer, since the pictures are drawn by the actinic power, and not by the luminous ray. Nay, more, the blue (the luminous ray) is, like the red, a positive hindrance to the working of the actinic power. It is most difficult to obtain good photographic results under the bright sun of the tropics. Moreover, if a spectrum be thrown on a prepared photographic surface, there will be two points only where the paper is preserved positively white: namely, the points on which the red and the yellow rays are respectively collected in the spectrum. Neither will seeds germinate so long as they are exposed to bright light. Again, by another experiment it can be satisfactorily proved that the trail in the blue ray alone renders that power which is the sole agent in photography; for if we exclude the blue rays by passing all the light admitted through a yellow glass, the most sensitive photographic material may be exposed to the strongest sunshine without undergoing any change whatever.

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* *Photographische Archiv.*

* *Anthony's Bulletin.*

The result of the experiment is, that germination is excited by the actinic power of the blue ray, the formation of leaf and wood by the luminous power of the yellow ray, and the development of flower and fruit by the heat of the red ray. How the actinic ray reaches the seed in the ground is hard to understand; but that it does penetrate where the luminous ray is unable to reach is plain from experiments, which go also to show that the exclusion of the luminous ray is necessary for the operation of the actinic. Shade is always, absolute darkness sometimes, necessary for the success of the germinating process. Plant cress seed an inch deep in three plots: over the first a blue, over the second a yellow, and over the third a red, glass. The seeds under the blue glass will be up days before those under the red, and of those under the red a few only will germinate. Those under the yellow will not germinate at all. It is found that those seeds which come up under a white glass in from eight to fourteen days will, under a blue glass, be up in from two to five days; that where thirty per cent. of seed came up before, sixty per cent. can now be raised; and that some seeds from tropical countries, which could not formerly be raised in this climate under a white frame, will germinate freely under a blue one. It would seem that the depth to which the air can penetrate the soil is the measure of the depth of germination. This is the practical result. There appears to be no limit to the duration of the dormant vitality of seeds, so long as they are preserved from chemical change. The mummy wheat sprang up again under the actinic ray after it had been sealed from the air for nearly three thousand years. The seeds in the coal measures have, unfortunately, undergone great chemical changes; otherwise there would be no reason why we should despair of seeing the indigenous palm groves of this land flourishing once more.

Correspondence.

PERMANENT PHOTOGRAPHY.

Sir,—The present being a critical and, perhaps, revolutionary period in the history of photographic printing, much general interest being evinced in the subject, and direct appeals made to us by correspondents of your journal, we shall probably be justified in taking part in the discussion.

The *raison d'etre* of autotype is "permanency." It has challenged professional and public criticism on this ground from the beginning, and must stand or fall by the justification of its claims. No one can be more interested in the matter than ourselves. We have a large capital at stake, our patent rights are steadily running out, and nothing but faithful photographic work can possibly consolidate and secure the success which, after years of struggle, begins to dawn upon us. Our interest and honour alike compel us to aim at absolute permanency of results as the one great end to be secured.

In a new manufacture like our own, an experimental stage is inevitable, and with the delicate shades of colour now achieved or attempted in autotype tissues, this stage is not wholly past: the relation of colours not only to light, but to the influence of the gelatine, the sensitizer, the alum bath, and even to the levigation, has to be carefully studied. Some colours, of the most incontestable permanency in regard to the influence of light, are yet wholly inadmissible, from the chemical reactions consequent to the process.

The problem is not, therefore, so simple as it seems, but it may be boldly averred that in the history of carbon printing, failure, in the sense of the loss of the image, is entirely unknown, and that examples of degradation of colour are so rare that time is wanted as yet to trace the relation of cause and effect. If we cannot speak *ex cathedra*, it is simply because the evidence is negative. Carbon prints have been distributed throughout Europe for the last ten years; the gems of art produced by M. Braun, of Dornach, have seen the light in the shop windows of every capital city, but complaints of fading are practically unknown.

To grapple more closely with the doubts and surmises of correspondents, it may be fearlessly stated that all the shades of colour obtainable in silver printing can be obtained in pigmented tissue, and absolutely unalterable under ordinary circumstances of exposure.

It is only by the recent demand for colours of exceptional brilliancy and bloom that the employment of cochineal colours becomes necessary. These, although in constant use by artists, are known to be in ordinary circumstances fugitive, but their employment under the protection of insoluble gelatine and a coating of collodion, as far as our experience goes, may be considered safe.

The recent researches of Mr. Howard on the salts of chromium yield very satisfactory evidence that the vehicle employed protects delicate colours from change in a very marked degree. The recent development of Mr. Johnson's double transfer process by the ingenious Mons. Lambert has given a great impetus to carbon printing in carte and cabinet work, and created a demand for the loveliest tones of colour obtainable. Our friends may rest assured that we do not intend to sacrifice stability to the demand. The Company has recently secured the services of a gentleman well-known in photographic researches, and of great scientific attainments, as "consulting chemist," and there is every reason to expect at an early date the introduction of one or two new portrait tissues of an exquisite beauty and bloom, and beyond the possibility of question as to permanency.

In the meantime, it is some satisfaction to read in the current number of the *Moniteur de la Photographie*, that Messrs. Geruzet, of Brussels (to whom belongs the honour of being the first photographers in Europe to abandon silver printing for carbon) recently submitted to the Photographic Society of that city examples of prints which for two and a-half years had been exposed to sunlight, and which prints, although in the opinion of some colder in tone by the test, yet preserved every shade of gradation, and were perfect photographic pictures. Our friends may rest assured that the major part of the autotype tissues are absolutely and unquestionably permanent; that if any doubt exists of any of the newer shades, it goes no deeper than a possible minute loss of bloom under long exposure to the sun; and that this doubt may be expected to be happily resolved by the issue of the researches now in progress.

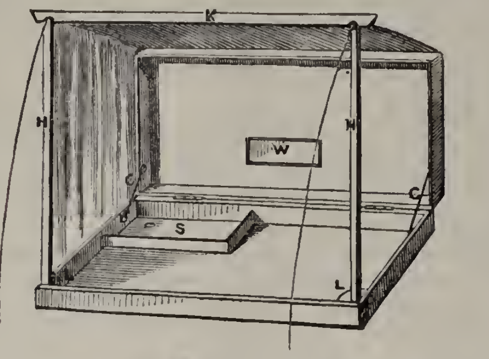
In reply to "Carbon Printer," allow the statement that, as a matter of business, we do manufacture a batch (twenty to thirty bands) of Autotype tissue, of any tint, to the wish or to any reasonable formula of our friends. Reproductions of works of art often demand a special colour, and that nearly all the permanent pigments of the artist are open to the carbon printer gives additional range and value to the photographic art.

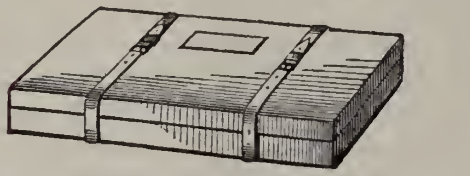
As the rapid development of the trade in tissue has driven us to further building and new and improved appliances in the manufacture, we shall hope (especially as now aided by the experimental activity of the profession) to produce tissues of an absolutely definite and satisfactory character.—Yours respectfully,

The Autotype Company.

A CONVENIENT TENT.

Dear Sir,—Having derived much information, and gained many valuable hints, from the pages of the Photographic News, I think it incumbent on me to add my mite to the general stock of information; and as the season is rapidly approaching when landscape photographers will have no time to waste, I purpose, with your approval, to place before your readers the description of a tent, which for simplicity, cheapness, and adaptability to the purpose for which it is designed, leaves nothing to be desired. It consists of a box measuring 26 by 20 inches, each lid being 2½ inches in depth, making the inside measure, when closed, 5 inches. The enclosed sketch will show the arrangement. C is a cabinet hook and fastener, for holding the box at right angles; W is a small window, with a shutter running in a slide outside, to protect the glass when the tent is packed; S, a sink, partitioned off by two pieces of wood, and coated with a solution of bichromate of potass and glue, exposed to the light to render insoluble, with a small hole, and a piece of gutta-percha tubing to run off the drops at the corners LL, inside, a piece of wood, 2 inches thick, cut at right angles, so as to form a square hole with the corner of the lid, into which is inserted one or two upright pieces. H K is a flat piece, about 1½ inches broad, with a hole at each end to fit into the upright H; this forms the skeleton, which is covered with a cover of black and yellow cloth, hooked tight to the sides, and left slack at the front, allowing the operator to draw it around him, thereby entirely excluding the light. The whole thing is fitted up in two minutes, and when packed and strapped weighs only 12 lbs. I carry all my chemicals in mine. I shall be very happy to give any further information regarding it to any one who may wish for it.—I am, sir, yours respectfully, Jno. Worsnop.





THE DAILY ILLUSTRATED NEWSPAPER.

Dear Sir,—Your correspondent "Goosequill" has plucked his plume from not the most sapient descendant of the sacred birds who saved the Capitol. Capital would now seem to be the special object of anserine watchfulness and—cackle. No offence, Mr. "Goosequill"; pardon a little fun. But, excuse me, your arguments hold good, as "Jo" would say, for "never a-doin' of nuffin!"

So far as I am concerned, "Goosequil" mistakes my aim altogether. I have no wish to take in any capitalists, and I should be sorry to lend myself to mere money-making by producing anything "cheap and nasty." My idea of a daily illustrated paper is not a journal that will make current incident its main object. Great judgment would be required in *selecting* such incidents, and, on the principle *noscitur a sociis*, the incident chosen would vividly stamp the character of the journal. Current incident is not the only field for illustration possessing daily interest. What of portraiture? Are criminals alone worthy of illustration? Can neither the past nor the present afford great and noble examples for all time?

Again, is there not landscape enough on this little ball to give at least a picture or two daily for a century or more? And, Mr. "Goosequill," don't pronounce me a lunatic if I ask, has astronomy no facts to interest and instruct? Would, for example, an engraving of the most recent observation of the moon's surface—a faithful transcript from a photograph—not teach something? Then further, leaving Nature, the unfathomable, inexhaustible store-house of wonder and beauty, have we not the great region of art? Are there no masterpieces of ancient sculpture, architecture, ceramic art, jewellery, &c., which can be rendered true in every detail as only photography and photographic engraving can render at almost nominal cost—have these no interest, old yet new, new yet old, to delight and instruct daily? And what of the art and arts of this nineteenth century? Surely it has some good things worthy of pictorial delineation in a daily journal. Truly the field is immense. There is an *embarras de richesses*. And when we lay science under contribution—ethnology, zoology, geology, botany, the wonders of the microscope, &c.—it will be seen that by the aid of the pen—not despising a good goosequill—by aid of pencil, the brush, and last, not least, the camera, a daily illustrated newspaper need never lack *pabulum*.

Such a paper would do more to educate, refine, and elevate thousands here in Old England, the Colonies, and even smart Jonathans over the water, than years of "Telegraphese," New York Heraldism, or any amount of "word painting."

The paper should be conducted "by gentlemen for gentlemen." And the clientèle would be found in all ranks; for he is a gentleman who has the soul of one. And when I say gentleman, I include Nature's highest type of gentleness and refinement—gentlewoman. The conductors, like all true gentlemen, will not overlook the ladies, even in the matter of the fashions. But let me add, they will be mindful of robin redbreast too, and will set their faces against all cruel and wicked fashions.

A daily illustrated paper need not be large at first. At twopence it could be made to pay well. At threepence, the price of *The Times* and *Punch*, there would be found thousands willing to pay even that sum for good paper, good printing, good literature, and worthy illustrations.—I am, dear sir, yours truly, Duncan C. Dallas.

362, *Gray's Inn Road, London.*

Proceedings of Societies.

Photographic Society of Great Britain.

The usual monthly meeting of this Society was held in the Gallery of the Society of Painters in Water Colour, on the evening of Tuesday, May 9th, Mr. J. Glaisher, F.R.S., in the chair. The minutes of a previous meeting having been read and confirmed,

The Chairman remarked that the meeting was honoured that evening with the presence of Professor Romelaere, of the Belgian Photographic Association. They were greatly gratified by his presence, and, in the name of the Society, he begged to offer Professor Romelaere welcome.

Mons. Romelaere, speaking in French, briefly expressed his acknowledgments, and his feeling of the great honour done to him and the Association he represented, by such a cordial reception. In the name of the Association Belge and his own, he thanked them.

Captain Philip was then duly elected a member of the Society.

Col. Stuart Wortley exhibited the Rev. Canon Beechey's split shade, which consists of an ordinary flap shutter divided into three vertical sections, any of which may be closed or open during exposure, so permitting some portions of a subject to receive a little more exposure than the remainder.

Captain **Abney** then read a paper "On a Method of Measuring the Diurnal Photographic Intensity of Daylight," and explained the apparatus he had contrived for carrying out his observations.

Col. **Wortley** asked for details of Professor Roscoe's formula for sensitive paper. Having given considerable attention to this subject of late, he was struck with the fact mentioned by Captain Abney, to the effect that Roscoe's paper would not keep, and suggested the importance of trying a more permanent paper.

Captain **Abney** did not remember the details precisely of Roscoe's formula. The silver bath was sixty grains (Captain Abney subsequently corrected himself, and said the bath was six per cent.). The paper would keep about two days.

Mr. **Spiller** asked if Captain Abney had experimented with carbon tissue in place of silvered paper.

Captain **Abney** regarded such tissue as less certain, and had not tried it.

In answer to the Secretary (Mr. **Friswell**), Captain **Abney** said he had not noticed any connection between sun-spots and the variations in light; but at present his records were not tabulated.

The **Chairman**, in proposing a vote of thanks, pointed out the importance of the subject, and referred to his own early experiments in a similar direction.

The **Chairman** announced that the paper expected from Mr. Harper was not yet ready, and would not be read in June, as announced. He further announced that Col. Wortley would read a paper at the next meeting, to be held in June.

The next Exhibition, it was announced, will be opened on the 8th of September, and pictures received from the 1st to the 4th of that month.

West Riding of Yorkshire Photographic Society.

The ordinary monthly meeting of this Society was held at the Commercial Hotel, Bradford, on the evening of Monday, the 1st May, Mr. Wm. **Cook**, vice-president, in the chair.

After the minutes of preceding meeting had been confirmed, the Society proceeded to elect the following gentlemen as members:—Mr. H. J. Herbert and Mr. Braybrook, Bradford; and Mr. R. Newsome, Shipley.

Mr. W. T. **Burrow** read a paper, on "A Few Notes on Dry-Plate Photography, Bath versus Emulsion" [in our next], after which was passed round a large number of tannin and Liverpool emulsion 12 by 10 plates, which were greatly admired by the members present. The emulsion negatives were pronounced the best, especially where it was a question of short exposure, although the tannin plates proved that in the hands of such a proficient dry-plate worker as Mr. Burrow, high-class photographs could be produced by them, showing that he was equally at home with the tannin and the emulsion processes. Mr. Burrow also exhibited diagrams of his drying-box, and informed the members that the idea was originated by seeing it in one of the almanacs as described by another gentleman—a successful dry-plate worker.

Mr. **Howarth** thought that Mr. J. W. Gough, their late president, was really the inventor.

Mr. **Howarth** moved, and Mr. **Thompson** seconded, a hearty vote of thanks to Mr. Burrow for his very excellent paper, which was unanimously carried.

The **Chairman** passed round a number of plates which were the results of some experiments he had made with Mr. M. Carey Lea's collocine developer. He stated that he had not found any benefit from its use, but intended to test it still further.

The meeting then became of a social and conversational character until its adjournment.

Edinburgh Photographic Society.

An ordinary meeting of this Society was held in the Hall, 5, St. Andrew's Square, on the evening of Wednesday, the 3rd inst., the President, Dr. **Thompson**, in the chair.

The minutes of last ordinary meeting were read and approved, and Messrs. James Anderson, John Miller, and W. B. Hay, were admitted ordinary members.

The principal business for the evening consisted of a demonstration of pigment printing, by Mr. Tunny, who, in introducing the subject, referred briefly to the fact that the two grand discoveries on which carbon printing, as presently carried on, were made by Edinburgh men: the first, the action of light on alkaline bichromates, by Mr. Mungo Ponton; the other, the exposure and development on opposite sides of the tissue, by Mr. Burnet. This was followed by some interesting historical details of the progress of carbon printing, and a tracing of the gradual development of the process up to its present very satisfactory condition.

The method of preparing the tissue was then fully explained, although Mr. Tunny did not think it was likely that photographers, generally, would trouble themselves with that branch, as really excellent tissue could be readily obtained as a commercial article. The method of sensitizing the tissue in the bichromate solution was next shown, and special attention was directed to the fact that a sheet much larger than the dish which contained the solution could easily be sensitized, if it were immersed in the form of a roll, and rolled and unrolled while in the liquid. The moist sensitized tissue was dried by being laid across a thick round stick, and it was then ready for the printing-frame. Considerable difficulty was said to be experienced in hitting the right time of exposure; but Mr. Tunny assured the members that that was easily overcome by a little experience, especially when aided by an actinometer, one form of which was shown and explained. Several pieces of tissue that had been exposed were then successfully developed on plates of opal glass, the after removal of the print being secured by a rubbing with French chalk, a thing that Mr. Tunny thought much better than the usual mixture of ether, wax, and resin, &c. Then some plates with prints ready for removal were operated on, and the prints handed round for inspection; the result being an unanimous expression of opinion that they were quite equal to anything that had been seen in pigment printing.

Attention was next directed to the production of transparencies for enlarging purposes, and Mr. **Tunny** said that the result of much experimenting led him to recommend the use of a tissue made with gelatine, saccharine matter, and mercuric sulphide vermilion. Tissue prepared in this way gave a beautiful non-actinic transparency thoroughly suited to the purpose. Several examples were handed round the table, and much admired.

In conclusion, Mr. Tunny said that complaints were sometimes made of the want of lustre or brilliance in prints by the single transfer process, and showed that this could be obviated by using ordinary albumenized paper instead of the transfer paper usually employed. The method he recommended was to draw the paper through strong methylated alcohol, to coagulate the albumen; and, when it was dry, to lay down the exposed tissue in the ordinary way, and develop on it. The result would be a surface exactly like a silver print on albumenized paper.

The **President** said he was glad to see Mr. Tunny's name in the billet, as he was sure there would be something interesting to be both heard and seen. That he was not alone in this opinion was evidenced by the very large attendance of members, and he was sure that all had been very much gratified. Mr. Tunny's skill and dexterity in manipulation were well known, and he was certain both had never been shown to more advantage than in the demonstration, which, he was quite sure, was as complete in all the little dodges and wrinkles that go so far to ensure success as experience could suggest; and such that none who had seen it need take a long journey, and pay three guineas, or any other sum. He should like to ask Mr. Tunny if negatives of various degrees of density were better printed under tissue of various qualities, as was the case in silver printing?

Mr. **Tunny** replied that he was not yet in a position to say definitely, but thought it likely that longer experience might show such to be the case. Varying degrees of intensity were readily obtainable in the tissue; the stronger the solution of bichromate, up to the point of crystallization, the more sensitive was the film.

In reply to another question, Mr. Tunny said that he had noticed, and taken advantage of, the continuing action of light, having been able repeatedly to give a shorter exposure than usual, and then after the lapse, of some hours, to develop satisfactory pictures.

Mr. **Dallas** wished to warn the members against trusting to make good work with the continuing action of light. Some time ago, when turning out prints at the rate of three or four hundred a day, he had tried to utilize it, but failed most miserably, the gelatine becoming quite insoluble, and the production of good prints an impossibility.

Mr. **Norman Macbeth** thought the prints just shown by Mr. Tunny were very fine. He had no doubt as to the permanency of the carbon, but very much as to the colouring matter by which the warm tone was given. If some of the lakes were used they would most certainly disappear. He would suggest the use of rose madder as a colour that was likely to stand.

Mr. Ross said that he was very much delighted with Mr. Tuuny's demonstration. He and Mr. Tuuny were sometimes twitted with being the *old* men of the profession; but it was quite evident that Mr. T., at least, had lost none of the vigour and dexterity which had always been his characteristics. The members were much indebted to Mr. Tunny for giving so freely the results of what must have been the result of a long experience, in such a way that any one who had seen it could not fail to succeed on a first trial.

Mr. **Turnbull** said, the thing that gave pigment printing its importance was the alleged permanency of results. Now, while the carbon was, no doubt, quite permanent, it gave a print of a disagreeable yellowish green colour, and required toning to please the eye; and the substance used for that purpose was not always to be relied on. He had got from Mr. Tunny a carbon print in January, and it had been hung in his studio ever since, one portion being covered by brown paper. The exposed parts had faded considerably, showing that it was not more permanent than a silver print. The print was handed round, but the members generally could see no trace of fading in the exposed parts. He went on to say that silver prints might, with proper care, be made as permanent as carbon, and that the cost of pigment prints—in consequence of the nature of the process by which they were produced—would be such as to prevent their general introduction, for a small work at least.

Dr. **Dickson** suggested the use of some of the oxides of iron to give tone to the carbon, as they would be found quite permanent.

In answer to a question as to the best way of managing an over-exposed carbon print,

Mr. **Tunny** said that an increase in the temperature of the water answers best; and

Mr. **Bashford** said that the action of a weak alkaline solution, such as carbonate of soda, would reduce the print satisfactorily.

Mr. **Dallas** then exhibited on the screen an enlarged transparency of the negative of the spectrum, with the peculiar workings, which was shown at last meeting, but, although several explanations of the phenomena were suggested, there was none that seemed to meet with general acceptance.

Votes of thanks were given to Mr. Tunny and Mr. Dallas, and the meeting adjourned.

Talk in the Studio.

Obituary.—The *Bulletin* of the French Photographic Society announces the death of its president, M. Balard, to whom, half a century ago, the sciences, and especially photography, were indebted for the discovery of a new element, *bromine*. M. Balard made also several other discoveries in chemistry and physics. He died at the age of seventy-four.

Transferring Negatives.—Take the negative on cleaned glass—not albumenized—and, when dry, warm it, and flow over a hot solution of gelatine, 1 ounce; water, 10 ounces; glycerine, ¼ ounce. Allow it to stand one or two minutes; then pour off, and dry vertically in a warm place. When perfectly dry and cold, lay it on a level plate of glass or stone, in a cool place, and pour on a plain collodion, ten grains of cotton to the ounce, to which is added three per cent. of castor oil; when this is dry, lay it in cold water for a few minutes, and the film will loosen, and, with a little gentle assistance, leave the plate. It can then be dried between sheets of blotting paper.—*Anthony's Bulletin.*

How Much a Dozen for Clusters.—A lady called on a photographer in Council Bluffs, Iowa, and wanted to know what she would charge to make her three babies in a "cluster?" No more groups; everything in that line now will be clusters.—*Western Photographic News.*

The Old Story.—The amusing persistence with which the old story of the discovery of a method of photographing in natural colours springs up in out-of-the-way places, is curious. The *Chicago Times* has the following:—"A photographer of Lyons, France, has made a discovery which is of immense importance. It is nothing less than a method of photographing colours, or producing naturally coloured pictures. The usefulness of the process of photography in science will be increased a hundredfold by this discovery, and its position in art will be advanced so as to overshadow all other branches. The faithfulness of its likenesses gave to photography its chief value when it was first discovered; but of late years so many means have been employed by way of 'retouching' negatives, &c., to conceal the truth revealed by the camera, that the photograph has become as great a liar as the painter's brush. The photographing of actual colours would do away largely with this flattery. Every pimple and blotch would stand revealed in all its chromatic glories. Artificial colouring by the brush upon the photograph after its completion could be easily detected, and the camera would be restored to its former position as a faithful reproducer of faces. In the photographing of landscapes a great advance would be made; while the paintings of the great masters could be copied, in all their excellence of colour and expression, by the million."

To Correspondents.

M. A. C.—The solution to which you refer as having been poured over a collodion positive, to give it additional brilliancy and detail, was probably a solution of bichloride of mercury. Dissolve fifteen grains of bichloride of mercury in an ounce of water, and apply to the positive after it has been fixed and well washed. This will change the deposit from its drab-tinted white to a more intense white, at the same time bringing out detail with more delicacy and brilliancy. The image should not be over-exposed to begin with. A vigorous image, slightly under-exposed, answers best.

A. S. F.—We do not remember the precise formula by which the paper used by M. Lambert in his actinometer was prepared. Carrier's paper answers very well. We believe the Autotype Company prepares paper expressly for this purpose.

Mr. J. **Eastham** points out that the method mentioned in Mons. Braun's specification is not new, having been used by several persons—himself amongst the number—for years past. In our Leader on the subject it will be noticed we mentioned the fact that it was not new, and that Mons. Braun had probably become aware of that fact, as he had abandoned the patent.

W. M. B.—The business in question continues in the same place, having passed into the hands of Lombardi.

White Hard.—A small metal box, to be heated by a spirit lamp, may be used to dry plates after varnishing, but we have a strong objection to the use of a lamp flame for drying varnish, if a simpler course will serve, and as a "crystal varnish"—that is, one with a benzine solvent, which dries spontaneously—answers every purpose for ferrotypes, we should use it, having no fire, in preference to a varnish requiring heat.

Amateur.—A decided improvement; but the negative is still just a little lacking in intensity for the quality of tissue you are using. A very little lighter printing would be an advantage.

Archer Clarke.—When cards are ordered with the bronze printing, we apprehend that the onus rests with the person giving the order, as the printer or manufacturer is not responsible for the results produced by the printing, if he has supplied the goods as ordered. The preparation of bronze powder being, to a great extent, a matter of trade secret, the printer using them can have no idea of their effect in photography, even were he a chemist. It is the business of the photographer (having been duly warned in the journals) to avoid the risks which cards so printed involve.

E. R. F.—Old negatives which have been in constant printing often become slow printers after a lapse of time. The film of varnish sometimes becomes of a darker colour from age, but, in addition to that, it often absorbs traces of silver, and so gradually darkens under exposure. Soaking off the varnish in strong alcohol, and then washing carefully with a solution of cyanide of potassium in weak spirits, will cleanse the negative, and restore its rapidity of printing.

B. L.—So far as we know, none of the patents which have been taken for various methods of colouring photographs are now in force. The ectograph was a collodion transparency. Of course, a carbon transparency, or a collodio-chloride transparency, will answer every purpose. The coating of white wax was intended for the purpose of intervening a layer of some semi-transparent substance between the crude colours and the transparent image, the effect of which was an appearance of softness and delicacy in rough work.

Excelsior.—There is no difficulty in vignetting a negative in the camera. Various methods may be employed; but that which we have tried with advantage consists in intervening a screen with an oval serrated aperture, somewhere midway between the lens and sitter; so that the edges of the aperture are quite out of focus. The size must be regulated by the size of plate, focus of lens, &c.

C. J. **Fairlie.**—Thanks. In our next.

Received: "British Manufacturing Industries," edited by G. P. Bevan, F.G.S.

Several Correspondents in our next.

The Photographic News, May 19, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Photography by a Short Cut—A Photographer's Guide to Health.

Photography by a Short Cut.—It is a little amusing to note the many enquiries which come addressed to the Editor, about this time of the year, for the details of some efficient, simple, and certain dry process, which correspondents are anxious to learn. Many there are who, having seen photography practised with apparent ease, and heard about new processes which give the operator magnificent pictures without any trouble or care being wasted in the matter, resolve to betake themselves forthwith to the art, and having purchased a camera and the needful paraphernalia, write off to Mr. Editor for information about the best and easiest process he knows of. Of course it is with dry plates that they mean to work, and they wish to know, therefore, which, out of the many methods published, he can most recommend. To them the matter appears simply in the light of an *embarras de richesses*. So many good processes exist that it is difficult to choose. Unfortunately for the beginner, dry-plate work is no easy matter, and this he speedily finds out. He gets images, it is true, on his dry films, but they are speckled and full of comets, and, moreover, yield hard, black-and-white pictures when printed. He does not know that far more practice and skill are necessary to secure satisfactory clichés from dry plates than from wet ones, and if he has never obtained soft and harmonious results by the ordinary process, he will scarcely succeed in producing them with dry plates. It is only of late years, indeed, that dry plates have become thoroughly understood, although, of course, there were masters in the art, like Russell Manners Gordon and others some time ago, who demonstrated that as good results could really be secured with dry as with wet films. It was in the early days very easy to distinguish the result of a wet from a dry plate, and a German photographer aptly likened the former to a leaf which had been freshly gathered, and the latter to one that had been dried and pressed. They were both of the same tint, and possessed the same detail; but the wet plate picture had a freshness and bloom which were altogether lacking in the other. This was certainly true, in most cases; but Mr. England, Mr. Gordon, and, others, nevertheless demonstrated, over and over again, that, with care, dry plates could be made to yield as good pictures as wet ones. Nay, Mr. Gordon went still further, and selecting half-a-dozen of the dry processes of the day, showed that in good hands they all of them gave unqualified results. Since then alkaline development has been introduced, and shortened the exposure of dry plates wonderfully, so that in skilful hands they have all the advantages of wet plates, with very few of the disagreeables of the latter. But, for all that, dry plate work is not easily practised, and beginners who think to obviate half their troubles by having recourse to so tempting a short cut will find the goal by no means so easy to reach as they anticipate. They make gain, may be, in the cleaning and preparation of their plates; but when they come to finish the cliché they will find alkaline development to be a science of itself, and one requiring study and practice to master. Gordon, to quote once more one of our best dry plate workers, was wont to say that he sometimes took up a whole day in the development of a couple of negatives, and it was due, he avowed, to this operation more especially that the success of his pictures was due. As it is, there are very few professional photographers who, if called upon to do important work, would not prefer to employ a wet to a dry plate; and this is not due so much to any doubt, as to the certainty of the result, as the greater difficulty that exists for anyone, unless he is a constant dry plate worker, to secure the same delicacy and detail which a wet plate at once yields. We would warn, therefore, those who are as yet tyros in the art that, in adopting dry plate photography, success has still to be wooed before it is won.

A Photographer's Guide to Health.—We are promised a further contribution by Dr. Henri Napias, of Paris, on the sanitary aspects of photography, whose first pamphlet on this subject is already well known to our readers.* As but few photographers are chemists, unfortunately, they know but little of the substances that they handle every day; and many ills that photographers suffer are clearly traceable to the influence of the chemicals with which thay so constantly deal. Many operators are occupied for hours together in busy establishments, exclusively in a dark room, coating and developing plates, an apartment probably with no ventilation, and therefore reeking with ether vapours. Is it to be wondered at that a man falls sick and ill, if he passes much of of his time every day breathing such an atmosphere? Dr. Napias not only insists upon thorough ventilation in such cases, but recommends, in the case of those who do much dark room work, the eschewing of spirituous liquors, as the alcohol and ether vapours that they imbibe as it is, is frequently quite as much as their systems will stand. Moreover, it behoves everyone who has to do with dangerous and noxious substances to be aware not only of their particular qualities, but to be conversant also with the antidotes to alleviate suffering, in case these should accidentally enter the system. A photographer's dangers are not all summed up in the word cyanide of potassium, it would seem, for there are other compounds—pyrogallic acid, to wit—which are almost, if not quite, as poisonous. The general resort to carbon printing brings the photographer into contact with bichromate solution, the corrosive action of which, especially in the case of strong solutions, is very great. M. Rommelaere, of Brussels, is of opinion that one may protect the fingers from the continued action of bichromate solution by the very simple precaution of steeping the hands first of all in a solution of paraffin in ether, or, if that is not at hand, of weak normal collodion containing castor oil. When dry, these preservatives are said to shield the fingers from any injuries they might otherwise suffer from being continually damp with the bichromate solution in the process of sensitizing tissues. There is another liquid which is still more corrosive, and which photographers have at times to do with—fluorsilicic acid—which is much employed for making vignette glasses, and which is generally used by pouring a little pool of it upon the orange glass, and then rubbing with a tuft of cotton wool. This liquid touching the fingers, and penetrating under the nails, gives rise to excessive pain, which cannot easily be alleviated, as it partakes more of the nature of a burn than anything else. These and many other matters might be treated with advantage in a little handbook, which would be exceedingly valuable to photographers, and we trust that Dr. Napias' forthcoming work will put the subject forward in such a practical and intelligible way that it can be consulted with profit by the humblest follower of the art. There is scarcely a photographer to be found who has not his suspicions that this or that compound or solution has at times injured his health, but it is rare indeed that he is able to bring the charge home. M. Napias has such an extensive acquaintance among photographers—for he is the medical officer of the Paris Photographers' Benevolent Society—that he, more than any one else, should be capable of giving us the advice we require.

PHOTO-MECHANICAL PRINTING IN GERMANY.

Dr. Vogel, writing to our Philadelphia contemporary on the progress of photo-mechanical printing in Germany, describes a phototype, or block-printing process, which has attracted the attention of experimentalists in this direction. He says:—

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* Reprinted from our columns, and published as a tractate by Piper and Carter.

"There are still many photographic processes to accomplish which numerous searchers are working, and which promise great profits to those who are successful; but, notwithstanding every possible endeavour, they have not yet been completed. Among these is the making of printing-blocks by aid of photography. He who is able to solve this problem can gain hundreds of thousands by it; perhaps many have found it, but of course they keep secret the treasure, while others try in vain. Artists, full of despair, on account of the spoiling of their most beautiful drawings by bad workmanship of the cutters in wood, call on me every year. They all say: Furnish us a process by which you are enabled to reproduce on wood any drawing as a printing block. Photo-block prints were lately shown by Gillot in Paris which were exceedingly well made; at all events they are the best I have seen. The process has become known in parts, and Herr Franz at Vienna made reproductions with success. But one cannot assert that the process is simple; it does not only require photographic, but also lithographical ability, and at the same time knowledge in etching the plates of metal.

"At first a negative is made from the drawing, which has to be strengthened with sulphuric ammonia to make it as intense as possible. The negative is copied upon paper which is covered by a coating of gelatine by the following composition:—

Gelatine	90 grammes
Red chlorate of potassa ...	60 ounces
Water	1500 ,,

"Let the paper float one to two minutes on the warm solution; dry it twenty minutes in a warm current of air; put it once more on a solution of gelatine, and let the same run off on the opposite side from the first drawing. The paper is lighted under the negative one minute by bright, and ten to fifteen minutes by subdued, light; then the copy is blackened. The ink used for this purpose is after Waterhouse, of the following preparation:—

Lithographic ink	240 grammes
Middling varnish	120 ,,
Burgundy pitch	90 ,,
Palm oil	15 ,,
Wax	15 ,,
Asphalte	30 ,,

"Mix the ink with oil of turpentine till of the consistence of honey; roll it out on a stone, and lay the copy thereon; let the whole pass through the press, and put it afterwards into water of 90° F. until the lines come out; wash after with warm water, then with a sponge, and subsequently dry it. The print thus obtained is carried over on a plate of zinc by a lithographic process, and is etched with gum-water and gallnut decoction. After having washed away this etching, it is rolled with a greasy ink, which consists of lithographic ink, white wax, colophony, and varnish. Dry this plate, and distribute on the surface pulverized colophony by dusting. This colophony adheres to the blackened places. The plate is cleaned by dusting, and the back and rim besmeared with shellac. By this time the plate is deeply etched, for which purpose one makes use of a rocking-trough, which must be kept in motion during the whole operation, in order to keep the fluid of equal strength. The first etching must be very slight, and only be extended to the white spots which are found within the deepest blackness. When the residue in this blackness has come out, wash the plate, dry and warm it uniformly over a stove. The colophony then melts and runs down to the lines which have formed an elevation by etching.

"It depends not upon obtaining immediately the sufficient relief for the print in the printing press, but every single etching must rather be limited to the different gradations which are given by the hatching of the drawings, so that the part having been sufficiently etched by the acid is protected against its further effects.

"From these result a succession of operations which can only be properly executed upon a basis of adequate experience.

"Let the plate grow cold, and roll it anew with lithographic ink; dust again with pulverized resin, and put the plate again into the etching-trough, in order to etch it now somewhat stronger. Afterwards it is again washed, dried, and warmed, so that the resin comes to the place which shall protect it from further etching. In the same manner it is done six to nine times. The half-shades then form a perfect covered black substance; whereupon the plates are put into strong etching-water, in order to excavate deeply the white places. Large white places must be covered with shellac before the etching, in order not to weaken too much the etching-water.

"After finishing the etching the plate is carefully washed with kali-lye and benzine respectively, and, when dried, it is ready for printing.

"It is a matter of course that the asphalte process can also be used for this process. The plate of zinc is covered with the solution of asphalte, and exposed under a negative.

"Rodriguez, the director of the Geographical Institute of Portugal, was even successful in obtaining plates of semi-tones. He rubs sugar of milk together with asphalte and lavender-oil; adds a mixture of asphalte and benzine to it, and places the whole on zinc, dries, exposes, and develops in connection with turpentine oil, and puts them into the etching trough. Here the acid loosens the sugar, and thus perforates the protected asphalte layer. The result is a tone which almost refracts the semi-tones of the original, and by this it is possible to obtain the restitution of the same by print."

A FEW NOTES ON DRY-PLATE PHOTOGRAPHY: BATH *V.* EMULSION.

BY W. T. BURROWS.*

At the request of many members of the Society I have jotted down a few notes in connection with my method of preparing dry plates by a bath process which has been a great favourite with me, and also by the Liverpool Dry-Plate Company's emulsion. My experience in connection with dry-plate photography extends over a period of something like twenty years, working pretty nearly every summer one process or other by the dry method.

Amongst all the bath processes I have worked I am inclined to think the tannin process the most simple and certain. One great thing in its favour is the quick and easy development of the plates; and this is of great and vital importance, especially to a beginner, as it is a well-known fact that there are more negatives spoiled in dry-plate photography by want of skill in development than by any other fault. That is the reason why I recommend this process to the novice in dry-plate work, as being the one in which he will be most likely to succeed in his first attempt at dry-plate photography.

In many hands the tannin process gives chalky negatives; but if the collodion only contains sufficient bromide, that should not necessarily be the case. However, I found, after trying several bromo-iodized collodions in the market, Mawson's ordinary negative collodion, with two grains per ounce of dried bromide of cadmium added some two or three days before using, to be the best I could procure.

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* Read before the West Riding of Yorkshire Photographic Society.

I will give you an outline of my method of preparing tannin plates, which varies a little in detail from the original formula by Major Russell. A few examples, taken by my modification of the process, I shall hand round presently. They embrace rather difficult subjects, such as a deep glen or a badly-lighted rivulet in a wood bottom. I first coat the plate with albumen :—

Albumen	1 ounce
Water	20 ounces
Ammonia	1 drachm

Beat well up with a fork in the usual way, filter, and add the ammonia. I generally make a large quantity at once —in fact, as much as will last me two or three years—and from time to time I add a little ammonia to make it keep. I find it improves wonderfully with age. When it is old it flows over a clean glass plate as even as collodion, without running in zigzag lines, as it usually does when new. However, if it have a tendency to do this, I pour a pool of albumen on to the centre of the plate, and then with a flat camel's-hair brush, two or three inches wide, spread it all over the plate. As soon as I have got the plate wetted all over with the brush, I pour on some more, which now flows evenly enough, in consequence of the plate being wet all over. I now run the lot back into another bottle, in the neck of which a funnel is placed with a little plug of cotton wool in it. By this method I have my albumen nice and clear for every plate, and also have the back of the plates free from albumen stains. I have tried the method of coating while wet under the tap, but do not like it as well as this, on trial of which it will be found to be quite easy to manipulate. Dry quickly before the fire, or in a drying-box.

Coat the plate with the collodion before mentioned, and let it well set; then dip it into the silver bath, which may be slightly alkaline, and kept well up in strength :—

Silver	45 grains
Distilled water	1 ounce

Let it stay in the bath at least ten minutes, of course raising the plate a few times in the usual way. If your collodion be in proper condition you should have a rich, thick, creamy film. Now have ready four or five dishes or baths. Let the first dish contain distilled water and a little acetic acid, say—

Water	2 ounces
Glacial acetic acid	1 drachm

I prefer this method to having an acid silver bath. The other three or four dishes may contain ordinary tap water. Pass the plates on, as you go on preparing, from dish to dish; finish them off by rinsing well under the tap, and finally with a little distilled water. When you have got all your dishes full—of course if they are small plates you can put several in one dish—commence with the preservative :—

Tannic acid	15 grains
Water	1 ounce

Filter bright; then pour into two developing cups as much of the preservative as will each cover the plate. Now take one of the cups and flow over the plate, taking off the water with it; drain slightly, and then take the other cup and pour on the next dose nicely and evenly, and let it stand on the plate about two minutes; then run that back into the developing cup, and use it for the first dose for the next plate; now drain, and then place in the plate-rack. When the rack is full, put the batch into the drying box.

My plate-rack consists of a small board fourteen inches long and about six inches broad, with two rows of strong iron wire driven in about nine inches high and two inches apart, and coated well with shellac. Along the bottom I lay two long strips of glass, edgewise up, and about half an inch wide, for the plate to rest on. This rack holds six twelve by ten plates, just fitting my drying-box, which is something like an ordinary magic lantern in design, only much wider. Along the bottom of the drying-box I have a pipe, perforated with a number of small holes, both ends of this pipe terminating outside with a bell mouth; this is for a proper supply of pure fresh air. The box stands on legs just high enough for one of the ordinary Bunsen burners, or, better still, one of the popular gas stoves used for boiling kettles. The latter do not stand above two or three inches high, and are very handy, being placed under it, by which means the air in the box is heated, and passes off up the chimney on the top of the box, like a lantern. This is the most perfect piece of apparatus I have ever had constructed for drying plates. The idea I originally got from an article in the *British Journal* some years ago, by the Rev. Canon Beechey, who had one constructed for his own use by Messrs. Rouch and Co., of London. It answers perfectly, the plates being in a current of pure, dry air. With one of the ordinary gas stoves I can keep up a nice temperature of about 140°, which answers admirably both for bath and emulsion plates. But I must not omit to mention that the board of my plate-rack is filled with small holes, to allow the passage up between each plate of a sufficient quantity of fresh air from the perforated pipe beneath it. My box is made of thin sheet iron, but I should think tin or zinc would answer. However, I strongly recommend every worker in dry-plate photography to have something of

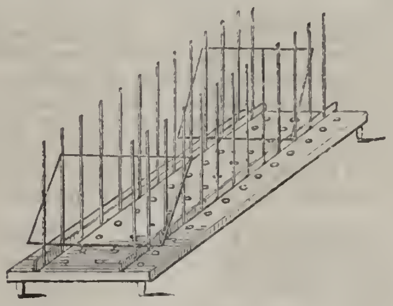
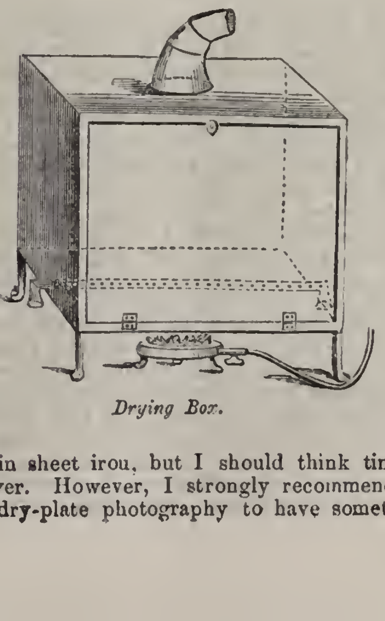


Plate Rack.



Drying Box.

this kind constructed—that is, if he wish to dry his plates evenly, and free from drying-marks and dust.

If the box be only for small plates—such as stereo., or even up to eight by five—one of the tin biscuit boxes from the grocers will do. Make a plate-rack to fit it, and partially cover it at the top, leaving, of course, room enough for the moisture to escape. If it be in the evening when you are preparing your plates—as is usually the case with amateur photographers—light a spirit lamp, which place under the box at a sufficient distance from the bottom to obtain the requisite amount of heat, and let there be just sufficient spirit in the lamp that you know will burn long enough to dry the plates, which can be going on all right after you have gone to bed and well on to sleep—perchance dreaming of achieving great things with these selfsame plates which you have been so carefully preparing. These drying-boxes, I find, answer admirably both for albumenizing the plates and also varnishing the finished negatives. They are more free from dust than a fire, and very often more convenient. I have made a rough sketch of my rack and drying-box, so that the members may better understand me.

(To be continued.)

ON THE DIFFERENCE BETWEEN CARBON AND COLLODION TRANSPARENCIES FOR ENLARGEMENTS.

BY W. T. WILKINSON.*

In making transparencies for the reproduction of negatives, large or small, the photographer has two methods at his disposal—viz., by the carbon process, or by one or other of the silver processes. In saying silver processes, perhaps it will be as well just to state what those processes are. Well, to begin with, there is wet collodion and pyro developer, and wet collodion and iron developer. Then there are the innumerable dry processes, and the albumen process; these processes depend upon a latent image being developed by the deposition of silver on the parts acted upon by light.

Now, for the production of transparencies for enlarging from, it is necessary that the image shall be textureless, or as nearly so as possible; that the deposit shall be as homogeneous as possible; that the whole of the detail, in both shadows and lights, shall be reproduced precisely as in the original; and also that there shall be no loss of sharpness. When everything is in harmony—the chemicals, light, &c.—with iodized collodion and pyro development, it is possible to get all these conditions, but the uncertainty is very great. The same may be said of the albumen process. As for the dry process, I fancy professional photographers are too dignified to mess about with dry processes, therefore I will pass on to the process that is used most by photographers when they do their own enlarging, viz., the ordinary wet process.

Transparencies by this process have only one good quality, and that is, they can be produced without going out of the ordinary routine of business: else they are difficult to get without texture. Hardly two pictures can be secured which will have the same amount of deposit, which graduates from fine sand in one to boulders in another (*i.e.*, under the microscope). If, however, the light and chemicals and exposure happen to be all right, then the transparency may fulfil these two first conditions, being of good texture, and the deposit fine; but under no circumstances can a collodion transparency compete with one in carbon, in the matter of detail in lights and shadows. If the exposure has been sufficient to get the half tones in lights well covered, the shadows are gone (because of the light); and if not properly covered, then the shadows are mere blotches.

And now, having described to you the faults existing in wet collodion transparencies, I will show you some transparencies done in carbon, from which I would undertake to do what I have often tried to do with collodion transparencies, viz., reproduce negatives (same size) that were as good as the original negatives; and that may be considered as the best test a transparency can stand.

A FEW WORDS ABOUT LIGHTING.

BY GEORGE CROUGHTON.*

The time has long passed when the sole idea of the photographer was to get as much light as possible from any direction. I can remember a circumstance which happened to a friend some fifteen years ago, which has occurred to more than one. This artist had a long, low skylight in his studio—the only light he could get, as there were chimney-pots all round. He made very good pictures in this studio, and succeeded so well that he was enabled to buy the house, and make a grand place. He pulled down his old place, and built a new one a storey higher, clear of the chimneys, and put glass almost all round. You may guess his surprise and dismay when he found he could not get such good pictures in his grand new place as he could under the old skylight. He was taught a practical lesson which many photographers have yet to learn, namely, that it is the quality, not the quantity, of light that is required.

My experience is, that diffused light of any kind is to be avoided; and if I had to build a new studio to-morrow under the most favourable conditions, I would have no light on the south side. A long steep ridge, which is both top and side light in one, is the one I should choose. But the form of light is not so important as the knowledge of what is wanted in a picture; that knowledge enables the photographer to get the effects desired in almost any kind of studio. My journey into Scotland proved this to me practically, for I saw well-lighted pictures, full of modelling, turned out in studios such as I had never seen in England. In Largs, Mr. Fergus had just erected a studio which was all top-lighted. If I remember rightly, there was no glass at the sides at all, and the sides were at least seven or eight feet high. Mr. Fergus, of Greenock, and Mr. McKenzie, of Paisley, both worked in the same manner, with a high top-light without side-light. This is only an illustration of the fact that, knowing what to do and how to do it brings success, not the tools we work with; for the light is the photographer's tool, to be used with judgment and discretion.

Now, I will try if we can arrive at a knowledge of what to do, and how to do it will follow. We have, as photographers, to make a portrait; and, as artists, to make a picture if possible. To begin at the begining, you must place your sitter in front of your background. If you place him (or her) in the open air, the shadows are all thrown downward from the predominance of top-light, the face is flat because the light is from both sides, and if a photograph were taken in such a light, the result would be weak, flat, and poor, with black shadows under the eyebrows, nose, and chin. Now screen off the direct top-light. The face is still flat, but the many downward shadows have disappeared. Now screen off one side as well as the top-light, and the face is not like the same. With the light all round the face, it would appear broad, flat, and altogether deficient in character. Now, it is just the reverse; there is too much light on one side, and too much shadow on the other; every prominence upon the face is exaggerated, and the texture of the skin shows with a coarseness which is far from natural. As Artemus Ward says, "Why is this thus?" Because there is too much direct side-light. Screen off the side-light until you get a delicate shadow upon the edge of the lighted side of the face. This will send the ear and the retiring edge of the cheek into their proper places, and concentrate the highest lights where they should be—upon the forehead, over the eye, upon the nose and chin; but still the shaded side of the face is too dark for photographing. And here comes the difference in practice. Some would use a screen to soften the shadow and give reflected lights. This is right enough if you use large screens, and keep them far enough away from the sitter to give the reflected lights as they would be if reflected from the side of a room. In my own practice I prefer to use a little of my far-off top-light to soften the shaded side, but then my studio is very small, and I get my reflections from the wall of the studio; in a wider place reflecting screens would be necessary.

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* Read before the South London Photographic Society.

* Read before the Glasgow Photographic Society.

There is nothing I think so useful as a three-leaved screen, hinged and upon castors, white on one side and grey upon the other, and so hinged that one leaf of each colour can be brought into the other if wanted. The facility with which the leaves can be placed at any angle for reflection is of great value. Small hand-screens are, in my opinion, a mistake. They concentrate reflected lights upon the face only, and sometimes only on parts of the face. The screen should be large enough to give the same reflected lights upon both face and drapery.

So far, then, in making a portrait. What comes next to make it a picture? A photograph may be a likeness, and yet not be either a picture or a faithful portrait. To make a picture it should have expression, repose, concentration, and keeping.

The expression, to a great extent, depends upon the sitter; but the artist can put that sitter at his ease by his manner and conversation, and so get him at his best. Another thing tending to destroy an easy and natural expression is too great an amount of light. With some persons even an ordinary light will cause a frowning contraction of the brow, which gives to the best tempered face an ugly scowl. Temper the light to your sitter until he can open his eyes naturally, and he will not only feel easier, but will look so, and pleasing conversation and easy manners will do the rest.

Concentration, keeping, and breadth, are the three essential qualities which will make a portrait a picture. The centre of interest is, of course, the head, and upon that the attention should be concentrated. This must be done by keeping all other parts of the picture in subjection to it. This is easiest done upon head and shoulder pictures, for there is nothing to sacrifice to the head. Sir Joshua Reynolds said, "The more you put in a picture, the more the sacrifice." Wherever a light cuts against a shadow there will be concentration; therefore do not let your coat cut against a light background. I like a dark background, but not a flat one. By the use of curtains and a three-leafed screen, I shut off the light from the top and side of my background nearest the light. By these means I get a gradation of shadow upon the lightest side of the sitter, so that the lighted side of the head is relieved against the shadow side of the background. I get balance upon the other side by the use of a dark curtain or piece of furniture. It could be obtained by graduating the colour of the background upon that side. A low side-light will destroy keeping, by lighting up the lower part of the figure to the same extent as the head, and so bringing into equal prominence the head, hands, and feet. My studio is so situated that a garden wall cuts off all light five feet from the ground, and I am all the better for it; for if I build another place I should not have glass lower than five feet from the floor. This keeps the lower parts in subjection. Be careful in placing accessories that you put nothing which will either by its colour or reflected lights cut up the picture. Concentration is obtained by keeping all your lights together.

Breadth is obtained by secondary lights lower in tone than the principal light, being carried into the shadow. These lights should get lower in tone the farther they are removed from the principal light. There is concentration in a white spot upon a black board, but no breadth. A judicious gradation of lights into shadows, and shadows into lights, will give breadth to a picture.

THE MOISTENING OF CARBON PRINTS BEFORE DEVELOPMENT.

BY DR. LIESEGANG.*

In most instructions relative to the development of carbon prints will be found a notice to the effect that the tissue, before it is laid upon the glass plate, should be put into cold water, and taken out again as soon as it lies perfectly flat. It should not be permitted to remain longer than this in the water, we are told, for when the gelatine is full of water it will not adhere to the surface upon which it is to be developed. In employing the tissue as it is at present prepared with soap, there is no need at all for being so hasty in this operation of moistening the tissue, for I find that tissue which has remained for hours in cold water actually attaches itself better to a glass plate than that which has been moistened for a short time only. The outer margin is sometimes raised by the squeegee passing over it, but this again easily attaches itself to the glass during the interval of waiting that must supervene before the image can be developed, provided a glass plate is put upon it, and some amount of pressure or weight applied.

I have undertaken a series of experiments in the matter, and have found several advantages from this continued soaking of the tissue. These are, firstly, that the image may remain a longer time between printing and development without becoming darker, which is invariably the case if it is kept in a dry condition. It is not necessary, therefore, in order to produce uniform impressions, to go on developing throughout the day. Secondly, the tissue attaches itself in a very perfect manner, and it is very rare indeed that air-bubbles are to be seen. Again, in developing, the backing dissolves away very quickly, and the image appears with greater rapidity; the surface of the image is much more even and polished than in the case of paper only slightly moistened. There is no need, however, to permit the print to remain for hours in the water to produce these results, for a sojourn of ten minutes amply suffices. At any rate, it will be seen from the above that it is by no means necessary or indispensable to be so rapid in the execution of the damping operation, for an interval of a few minutes more or less certainly does not matter.

The idea may occur that the gelatine when full of water has a tendency to swell in its dimensions sideways, and that when the squeegee is pressed over it the detail of the picture will suffer accordingly. The first is certainly the case, but the second does not occur. At any rate it was impossible for me to discover, under a microscope, any difference in the sharpness of two pictures, one of which had remained ten seconds and the other four hours in the water. I found by carefully measuring the pictures that the first was in an immaterial degree larger than the negative, while in the second case ninety-five millimetres had become ninety-six. The breadth of both pictures (one hundred and forty millimetres) coincided precisely with that of the negative, although some difference here might have been anticipated. No doubt the direction in which the squeegee is employed over the picture has some influence upon it, for in the case of all carbon prints that have been measured by me, I have found that in one direction or the other they have been, only in a very slight degree, of course, larger than the negatives from which they were produced.

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* *Photographische Archiv.*

The Photographic News.

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TRANSPARENCIES FOR ENLARGEMENTS.

An interesting but desultory discussion was evoked at the South London meeting by Mr. Wilkinson's paper on transparencies for the production of enlarged negatives. The subject is one which has, during the last few years, acquired especial interest, since the plan of making an enlarged negative has superseded to a great extent other modes of producing photographic enlargements. A difficulty felt at the outset of the discussion arose out of the fact that the transparencies exhibited by Mr. Wilkinson were produced by the Autotype Company, and, as it was alleged, by a secret process; and further, that the results with which some members were disposed to compare them, those of Mr. Edwards, were by a secret process. Considerable amusement was produced by announcements made that both the secret processes were understood to be published, and accessible to all photographers!

Apart, however from modes of production, there can be little doubt, we think, that Mr. Wilkinson was right in the position he assumed in his favourable comparison of a carbon transparency with a collodion transparency. Rarely, under any conditions, however favourable, can a transparency on a wet collodion plate, exposed in the camera, and developed with an iron solution, compare remotely with a carbon image in freedom from texture; and in speaking of a collodion transparency, it is generally one produced under the conditions we have named, which is meant. Special operators with special experience may be able to produce on a wet collodion plate, with pyrogallic acid development, a comparatively fine textureless image; but this experience is not the general experience of the ordinary wet-plate worker. And even with the most experienced hand in this line, the necessity of securing a textureless collodion, not always easy to secure, is imperative. And with the most perfect film and exceptional skill, it is rare that the image obtained in the camera is so suitable for enlargement as that produced by superposition printing. A transparency from an emulsion plate developed by the alkaline method, if the collodion be of suitable character, leaves little to desire. The same may be said of other dry plates, and in a still more eminent degree it may be said of albumen plates and gelatine emulsion plates. But to the ordinary professional portraitist, to whom enlargement is often the most important, the advantages of these processes are of small importance. He is not familiar with them, and the facilities, in the shape of material and experience, for working them, are as inaccessible as the carbon process, or more so. He is familiar with, or it may be master of, the ordinary wet process; but he finds that an enlargement made by this process throughout, transparency and large negatives, gives him heads with rough ropy looking hair, rough definition, and coarse reticulated skin. If it be necessary to abandon this process, the easiest mode of making another form of transparency is supplied by the carbon process, for which he can get all the materials without any trouble.

In the transparency by the ordinary wet process are often found several defects which are fatal to delicacy in the enlargement. The collodion possesses texture not noticeable in the small image, but looking like morocco leather when enlarged. The deposit of silver thrown down by iron is irregularly crystalline, and looks like sand in the enlargement, giving coarsely-blurred looking lines, and this defect is often intensified by camera printing, some diffraction probably occurring. The carbon image is composed of gelatine, and a colour amounting to something like a dye, than which nothing can be more free from texture. It was alleged at the meeting that Mons. Lambert had something added to his transparency tissue for enlargements to give it a granular texture. Whether this be so or not we do not know; but it must be borne in mind that a granulation under control, adopted for artistic effect, is a very different thing from the irregularity of a reticulated collodion film, combined with the sandy effect of silver reduced by iron development, neither of the irregularities under control.

But the serious difficulty which many photographers have experienced has arisen from the absence of instructions for the best mode of working. Very good carbon transparencies could be produced, but not equal to those produced by the Autotype Company. Whether the maintenance of the secret in the matter was politic or not, we are not discussing. It must be remembered that many thousands of pounds hitherto unproductive, or nearly so, have been sunk in the enterprize; the production of enlargements has recently become an important branch of the business of the Company, and hence the reservation for their own purposes of a trade secret was not altogether unnatural. It has been alleged, however, that an important element in this secret method is the substitution of a film of insoluble gelatine for one of collodion as the couch for the carbon image. This, it is clear, must be an advantage. The texture of collodion not bearing enlargement is one of the difficulties in the wet collodion process, and hence to use a film of collodion to support the carbon image was clearly a blunder. A gelatine film was the fitting couch for gelatine image when entire absence of texture was desired. Mr. G. Willis, of Scarborough, having expended much time and material in endeavouring to produce results equal to those of the Autotype Company in freedom from texture, was at length enabled to exclaim, "Eureka!" With great liberality he gives the results, which have cost him much effort, to his photographic brethren, in the pages of our last Year-Book. For the convenience of readers, we quote the salient part of his article here. After some preliminary remarks on the use of carbon for enlarged negatives, he says,—"This is a branch of the carbon process of which the details have been very carefully kept back from photographers generally. There are a great many photographers, I believe, would do their own enlargements if they had reliable formulæ for making the carbon transparencies suitable for the purpose. There is no information on this point in any of the four editions of the Autotype Manual. All they tell you is on transparent media, such as glass or talc being destined to remain permanently upon the materials. The adhesion cannot be made too complete for this purpose. If glass be employed, it must be made chemically clean, which can be effected by the use of nitric acid or caustic alkalies. If talc is intended to be employed, its surface will not require any preparation. Instead of the care thus requisite to obtain a chemically clean surface, we can have recourse to collodion; but the collodion must not be allowed to dry, but must be plunged into water before it sets. Upon the glass thus cleansed or coated, or upon the piece of talc, the exposed tissue is laid exactly and with care as described. It is developed as usual, and allowed to dry. It may now be mounted in either of two ways: first, as a picture to be viewed by reflected light upon an opaque backing; or, second, as a transparency which may be employed as a window decoration, or to be viewed in the stereoscope, or as a magic lantern slide. In either of the latter cases a pigmented paper of greater density than usual should be used to obtain the necessary vigour. This is a class of work only few require. Such transparencies as these are not suitable for enlargements; for no matter how chemically clean the glass may be, when the wet pigmented paper is placed upon it, and all air and water scraped out with the squeegee, the tissue will not adhere to the glass close enough to make a transparency suitable for enlarged negatives. It will do so quite well enough to hold the tissue film during development in hot water, and will answer the purpose for window decoration, or stereoscopic or lantern slides as stated. If a transparency of this description be placed in the enlarging camera, the enlarged picture will be found covered with a network all over, simply because the tissue has not been held firm on the glass plate during development of the transparency, and is not seen until enlarged. If the glass be coated with collodion and dipped in water, and the tissue developed upon it, it mends to a great extent this defect, but causes another equally as bad: that is, the collodion film is enlarged, and the enlargement would be as bad as a collodion film would be without the tissue. In the production of the transparency I used thirty feet of the Company's transparency tissue in trying to get good results for enlargements, but always failed. I tried every means to clean the glass, as great stress was laid on this point, but always failed. I gave it up for a time, until a letter appeared in the Photographic News, from the Autotype Company, stating that the tissue sold by them was the same as they used for their own work; but the way of using it they declined to indicate, and confined instructions in the practice of it to the licensees under the patent. After that letter it was clear to me that there was a secret in the production of transparencies in carbon for enlarged negatives. I obtained another thirty-feet band of the tissue determined to try to find out the secret. In a very short time I was rewarded for my trouble. It occurred to me that the glasses must be prepared in some way to receive the printed tissue for development of the transparency, and that it must possess the property of retaining the wet tissue firmly during development in hot water without leaving the glass; also to be capable of expanding and contracting in the same proportion as the pigmented tissue itself, to get rid of the network as before named, and when dry to be perfectly fine and smooth. I saw that this must be accomplished to obtain a perfect enlarged negative from a carbon transparency. This I found could be most easily and simply done in the following manner:—Take Nelson's gelatine eighty grains, water five ounces. Place the gelatine in the water (cold) for an hour, then place the cup that contains it in hot water, which will dissolve it. In another ounce of hot water dissolve three grains of chrome alum, and mix it with the gelatine solution, and filter through fine muslin, and coat clean glasses with this solution—the same as coating a plate with collodion—and assist it to the edge with a glass rod, and place away to dry in a place free from dust; then place in boxes until wanted. Any number may be done at one time, as they will keep any length of time. Print a piece of carbon transparency tissue (sold by the Autotype Company) in the usual way, place one of the coated glasses in a dish of cold water for about a minute before placing the printed tissue in the same dish, then place the tissue in the water, and as soon as it becomes nearly flat bring the tissue face to face with the coated glass, and leave both out together, and scrape the back of the tissue with the squeegee to get rid of the greater part of the water and air-bubbles; then let stand five or ten minutes, then place in hot water to develop in the usual way; place away to dry. When dry, the transparency is ready to be placed in the camera for enlargement, and will be found capable of making negatives equal to those done by the Autotype Company. To make the best enlarged negatives from a transparency of this kind, the transparency should not be less than eight by six inches, for an enlarged negative twenty-four by eighteen inches, and should be done with a lens of twelve inches focus. If this size be done with a lens of shorter focus, there will be a falling off at the edge of the enlargement, no matter how good the lens may be, and all other sizes should be done in the same proportion.

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A HOODED SHUTTER FOR LENSES.

Mr. J. F. Ryder has patented, in the United States, a hooded shutter for the lens, which he describes as an "eyelash for the camera." The circular which he issues does not give a detailed description of his invention, but it is sufficiently suggestive to enable readers to form some idea of the contrivance, which seems to act as hood and curtains during exposure, as well as a cap or shutter to the lens. His circular proceeds as follows:—

"All photographers know that the camera is like the human eye in seeing things photographically. All know the eye sees better when protected from strong light. Many know that too much light enters the eye of the camera, and prevents its seeing and impressing the image clearly; particularly is this the case in making shadow effects where the camera is more or less pointed toward the light. Again, when the sunlight enters the operating-room and falls directly upon the camera, even through a curtain, and again in out-door viewing, all have experienced the bother of the sun in the lens.

"This newfangled notion meets the trouble, and effects a cure.

"Its next value is the easy and effective means of opening and closing the camera tube. It is attached to the upper front end of the tube, and, when open, forms a canopy or awning, projecting sufficiently to cover the mouth of the tube when closed. The framework is of metal, and it is opened or closed by means of a spring hinge. It is covered with black velvet, which is extended beyond the frame, and forms side curtains to more effectually screen the lens. A touch of the hand immediately opens or closes the camera. It is always in its place, and always ready.

"The operator who spleens against running across the room, chasing the cap as it falls from the camera, or who finds the cloth on the floor instead of covering the lens, will take kindly to this sensible improvement.

"The proprietor who likes to keep his lens clean from dust and dirt, and the strong light shut out, to prevent the gradual yellow tint that strong light surely brings, and makes the work slower and more slow year by year, will welcome it.

"Directions for adjusting accompany the lashes."

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SENSITIVE PAPERS FOR PHOTOMETRIC PURPOSES.

BY CAPTAIN ABNEY, R.E., F.R.A.S., F.C.S.

In reference to your article of last week commenting on my paper read at the last meeting of the Photographic Society of Great Britain, I wish to make the following remarks:—

Carrier's paper (of which I am glad to say we have a fair stock, purchased some six or seven years ago) I have used extensively in photometric experiments, though it is always necessary to test each sheet and portion of a sheet to ascertain its relative sensitiveness to some standard, as it varies immensely. Another drawback to the paper is the glaze it has, which renders comparisons of tints more difficult than would be the case were it of a dull surface. Years ago I reproduced a paper which has all the keeping qualities of Carrier's, and was fairly uniformly sensitive; but it was too slow in action, and hence its abandonment. Since taking the record of diurnal actinism in hand, I have been making a few experiments in finding a sensitive and permanent paper, and I was, therefore, the more glad to hear that Colonel Wortley had taken the matter into his serious consideration.

The collodio-chloride process which our Editor introduced is very promising, and, theoretically, would give correct registrations; but there are certain practical and pecuniary difficulties in the way which have yet to be overcome.

As regards carbon tissue, it seems to me that in the present state of our knowledge it would be unwise to trust to its indications, its age, and the state of the atmosphere, causing considerable variations in its sensitiveness.

I have again referred to Dr. Roscoe's paper in the *Philosophical Transactions* for 1863, and find the formula given there agree with the memorandum handed to me by him. The objections made at the meeting regarding the supposed loss of sensitiveness, &c., are fully dealt with in that paper, and those interested in the subject would do well to study it.

LANDSCAPE PHOTOGRAPHY.

BY W. J. A. GRANT.

Now that the season, as far as photographers are concerned, especially those who make landscape photography their study, is at hand, a few words on the subject may not be amiss. Much, of course, has been written, and much more will be written, on this point, but I do not think *too* much can be said about it, even though what is said is a repetition of what has been said before.

In the first place, with regard to dry processes, all out-door workers will agree that there have been of late vast improvements in this branch of the science, especially in the case of commercial plates, and I would recommend all, even the most bigoted wet-plate worker, to try some of the many samples now before the public. Many men who wish at times to use the dry process are unable to do so, owing to the time and care required for making plates not being at their disposal. To these I would say, try all the commercial samples in the market, and, having selected one as suitable, keep to it, and get familiar with its use. There is no doubt that commercial plates are prepared better now than formerly, and in my own case I find that I now can produce good negatives from plates made by a certain firm, while formerly plates sent from the same firm were (in my hands, at any rate) useless. An ordinarily careful worker will now find no difficulty in making really good printing negatives from commercial plates, while even a novice may soon learn to make good use of them.

Many will prefer to make their own plates, and let those who can, by all means do so; but a really successful worker can only become one by careful study and incessant practice, and this, as I have said before, requires much time and labour—pleasant labour, no doubt, but labour, for all that.

Turning to wet plate work, very little new can be said as far as the chemicals and apparatus are concerned, though a few hints, old as some of them are, may at least be useful to beginners.

Starting with the bath and collodion, no one should have any difficulty with these. Keep the former well filtered, and add to it from a stock solution, as occasion may require, the solution being the same strength as the original bath. Some say one thing and some another on this point, but I have used a bath under this treatment for years, and have never had a fault to find with it. I think most people who complain of getting thin negatives use their collodion too freshly iodized. I always find in the case of Mawson's and other samples that they work far better if used at least three or four months after mixing. If I have no collodion which has been iodized sufficiently long, I find the same end is gained by adding to a freshly mixed collodion some of great age, say two years or more, and of a very deep colour; of course a little of this goes a long way, but it is wonderful how it improves collodion which is too new: the exact quantity of the old collodion to be used I do not know, as this will depend so much upon what age it is required to be; but in an ordinary case I should say that to four ounces of newly-mixed, two drachms of the old collodion should be added. Be careful not to dip the plate into the bath too soon; the colder and damper the weather is, the longer should it remain out, and *vice versa*. If dipped too soon, the film will probably slip, and if kept too long you will have markings of various forms and shapes. Drain well before placing the plate in the dark slide, and always be careful to put two or three folds of damp blotting-paper behind the plate.

This brings us to the dark slide. Can anything be more clumsy than the form now in general use? In the first place, if the camera is in the sun, or even if it is not, you must draw up the slide under a black cloth, or else, in all probability, light will get in and spoil your plate; then you run the risk of breaking the part by the hinge when you turn it down; and, finally, there is more chance of the wind catching it and shaking the camera, than if there was no projection at all. The best form of slide I know of is one used in America: that part of it which you pull out is not hinged at all; you have a flat thin board, and this you pull straight out; the instant it is withdrawn, a little spring shutter within immediately fills up the gap left, and excludes all light; after exposure you push the slide again into its place, and there is no chance of any light getting in. You need never, with a dark slide of this description, use a black cloth over the camera at all, which, if there be any wind, is sure to blow about, and cause more annoyance than all the other things put together.

We now come to what I consider to be the most important part of landscape photography, and that which makes it so far more easy for an amateur to produce pictures than for a professional. I say *pictures* because, as we all know, it is not every good landscape photograph which is a picture in any sense of the word. I refer to choice of subject, and the hour of the day at which it ought to be taken. No rules can be laid down as to the former, though many books which have been written concerning this will do much good in helping a man to feel his way towards producing what he ought to produce in a pictorial point of view. And, as to the latter, let any one with any eye to what is beautiful choose a certain view, or, better still, what is commonly called a "bit," and look at it from the same point at various hours of the day, and he will see at once what I mean.

Shadow makes a picture quite as much as beauty of outline and form, and be the latter ever so fine, I do not believe the picture could be perfect without the former. Photographers cannot get colour, so they must make the most of what they can get, namely, light and shade, and if they pay attention to this, and mark well the time of day, to the minute almost, when the subject is at its best, they will make pictures as well as photographs, and please themselves as well as others.

Artists often tell us that we should stick to "studies," go in entirely for small "bits," &c., and never attempt distant views and the like, because, they say, one or two strokes with the brush will produce, in this case, far finer effects than can ever be obtained by means of the camera; but though I am myself a great advocate for "bits" and "studies," yet I do not see why we should not be more ambitious, and make as much use of the camera in depicting scenery with distant views as the artist does with his brush.

Artists admit the great use and beauty of photography, if it be confined to close objects, where great accuracy of detail is required; but, as a rule, they fail to see that pictures by the camera can be produced in any other way. My friend, Mr. R. Manners Gordon, whose very beautiful photographs most of us know so well, was an artist in every sense of the word, and I have heard some of the best landscape painters say so; even they admired his works, and fully admitted it, small though they were as pictures. Many a day have I spent with him while he was practising the art, and from him I obtained many useful ideas in respect to the foregoing principles.

Sunlight, we must remember, is absolutely necessary for producing good pictures; but we must be cautious in our use of it. Be careful that the cap of the lens does not fit tightly, for in many cases you may find that the lens has to be capped and uncapped several times before a sufficient exposure is obtained, and unless the cap fits loosely you will shake the camera. In removing the dark-slide from the tent to the camera it is generally the custom to place it under a cloth, and from thence into the camera. Instead of a black cloth I use a light case, lined with felt, into which the slide exactly fits. By this means it can always be kept in its proper position, and as felt is a non-conductor of heat, the plate is maintained at an even temperature. This plan will be found of much service in hot as well as in cold climates.

As to the developer, by using a saturated solution of iron much time and trouble are saved, whether working at home or in the field. This is, I think, generally known now, and most out-door workers use it. The majority of successful photographers seem to prefer the plain iron developer, containing about fifteen grains of the salt to the ounce of water, more or less. Nothing can be better during the present state of photography, though we may hope that before long something (but *what* is at present a mystery to all) will be found that will bring out the latent image with far less an exposure than we at present are accustomed to give.

Intensify with pyrogallic acid, three grains; citric acid, three grains to the ounce of distilled water, of course adding a few drops of silver solution. It will always be found convenient, in working in the field, to use a mixture containing equal proportions of glycerine and water after development, so as to keep the plate moist before intensification and fixing, both of which operations can best be performed at home. After the developer is washed off, pour on the glycerine and water, drain slightly, and place the plate in a draining-box. Plates so treated will keep a long time. The use of golden syrup for this purpose may or may not be good; but experience teaches me that it is not to be depended on, and in many cases it causes unaccountable spots and marking on the negative.

By being careful and cleanly in working, by remembering what has been said about light and shade, and by using good lenses and apparatus, a photographer of fair abilities ought, with ordinary care, to overcome all difficulties, and turn out good work, not only technically, but pictorially; and this he will do if he studies the subject well, and, above all things, has a real liking for his art.

I would advise no amateur to work with a larger size than nine by seven, as any negatives worthy of larger proportions can now be so easily enlarged, and to so great perfection. Unwieldy apparatus in the field is very troublesome, to say nothing of the extra expense involved in purchasing the same.

Before concluding, I may mention a plan which I think will be found of service in landscapes as well as in portrait photography. Every photographer knows the advantage to be gained by using transmitted light in developing the negative. This cannot generally be obtained, as in ordinary cases the yellow window is in front of the operator. My plan is as follows:—Have the sink made of thick plate glass (to avoid breakage) cemented together, on the under side of which cement a piece of non-actinic glass; this may be protected to a certain extent by a framework of wood, of course having the centre open; bore a hole at one corner, and let the waste-pipe be attached here. In using it in the field, a hole must be cut in the bottom of the tent or dark box, one inch or so smaller than the glass sink, which is then placed over it; by fixing a piece of white paper or cardboard on the ground directly under it, you will see exactly when to stop the development. Keep the front window in the tent as well, so that either may be used. Light from the front windows should be excluded during development.

The approaching summer promises well for photographers, and after so much bad weather we may hope for some days really fine. For myself, I shall be away in the far north among snow and icebergs, as I accompany Captain Allen Young in the *Pandora* as photographer. The work there will be hardly easy and plain-sailing but, with luck, good negatives may be secured. Two of the officers on board the ships composing the Government Arctic Expedition are experienced photographers, and we may hope ere long that we shall see some *bona fide* pictures of those wonderful regions, as there is no doubt they will bring home negatives worth seeing. Nothing in photography could, at the present time, be more interesting, and, should success attend them, a rare treat may be expected.

Correspondence.

KEEPING PLATES MOIST DURING LONG EXPOSURE.

Sir,—As a practical photographer, permit me to communicate to you a suggestion which, after your approval, I hope will be adopted by every photographer in the country: a light frame of wood, carrying a *thin* sheet of crystal glass, to rest in a groove in the camera, as close as possible to the dark slide; the image from the lens to pass through said glass, and so to the sensitive plate. From close observation I claim important and useful points in its favour. In reference to hot weather especially, the sensitive plate is not, by this method, in contact with the warm air of the camera, thereby keeping moist a much longer time than hitherto. The plate is protected from dust, which always lurks in all cameras. The plate is kept beautifully clean, thus saving the work of a spotter-out. The image, I fancy, is more delicate and rounded; and I find that the image does not suffer in the least from refrangibility, which, perhaps, is not the least point in its favour.

PS.—My employer is so pleased with my new "idea" that he has had all our cameras so fitted; and in our hardest worked camera about half an inch intervenes between the crystal glass and the sensitive plate. For cameras for hot climates, this improvement would be invaluable.

I had forgotten to say that the exposure is not in the least interfered with. J. P.

TROUBLES OF BEGINNERS.

Dear Sir,—It has occurred to me that the following few hints to beginners might be useful. The most common cause of failure of beginners is that they start expecting to get on perfectly well at first, or else that they are going to make some wonderful discovery; and when they do begin, at the first failure they are disheartened, and, of course, put it down to the chemicals or apparatus; and to mend matters, they spoil the bath, or else break their lens, after which they think photography a difficult thing, not worth learning. Now photography in itself is not a difficult thing to learn; but it requires experience to overcome the little difficulties which all beginners are subject to, and I feel sure if beginners were to bear in mind that there are three indispensable things required in photography—viz., brains, patience, and practice—they would get on much better. They cannot expect to obtain the same results at first as men who have been working at it for several years. It is practice that will make them perfect. Again, they are always trying every new process that comes out, and, naturally, they do not become thoroughly acquainted with any one. It would be much better if they would select a good process and stick to it, for then they would become master of it.

I feel certain if beginners were to bear these things in mind they would get on much better.—Yours truly,

R. N. P.

SENSITIVE PAPER FOR ACTINOMETERS.

Sir,—I observe that several of your correspondents are at present experimenting with various substances to ascertain how the best and most constant actinometer may be made, so I think that a description of one which I have used for some years may be interesting to them. It is made as follows: The sensitive paper, made as afterwards described, is coiled round a pin in the centre of a flat circular box, through a slit in the side of which it may be drawn out as required (similar to a measure), and short pieces exposed to the light. The paper has a line drawn on it, from end to end, of the same tint, a faint one, of a colour which the paper will assume on exposure, and the actinic power of the light is indicated with sufficient accuracy, at least for ordinary dry plates, by the number of seconds' exposure which it takes to render the line invisible. The paper is ordinary albumenized paper, sensitized by floating as for printing, and afterwards thoroughly washed, and any trace of free nitrate of silver being converted into chloride by finally washing in a weak solution of hydrochloric acid; it is then immersed in a five-grain solution of gallic acid, which makes it very sensitive and very constant. I enclose a small piece, which was prepared last September; but I have had it in use for more than a year on former occasions. I tint paper prepared with tannin in the same way, which answered very well at first, but did not keep so long. The great sensitiveness of this paper led me to try some experiments with it for printing; but I could not get it to tone.—I am, sir, your obedient servant, J. H. Ritchie.

Proceedings of Societies.

South London Photographic Society.

The usual monthly meeting of this Society was held in the Lecture Hall of the Society of Arts, on the evening of the 11th instant, the Rev. F. F. Statham, M.A., in the chair. The minutes of a previous meeting having been read and confirmed, Mr. T. Hicks was elected a member of the Society.

Mr. Fernley brought for the examination of members a number of fine photographs of Adelaide, Australia.

Mr. W. T. Wilkinson read a paper "On the Difference between Carbon and Collodion Transparencies" (see page 232).

Mr. Wilkinson exhibited some exceedingly fine transpariences, illustrating the position assumed in his paper.

In the course of a conversational discussion which followed, Mr. Taylor referred to the textureless image which an albumenized plate gave, and to the similar results obtained by Mr. Foxlee with collodion and pyro development.

Mr. Wilkinson had especially referred to the ordinary collodion process with which every one was familiar, and to which, as a rule, most professional photographers adhered. The great difficulty was the varied character of the results. If one good transparency was obtained, it was almost impossible to repeat it.

Mr. Bridge referred to the rapidity, excellence, and certainty of the emulsion process for the work as he had seen it worked by Mr. Brooks. These transparencies used for lantern work gave a capital result when enlarged to twenty-five feet.

Mr. York said that in their practice in producing lantern transparencies, they would produce sixty a day for one negative, all certain and satisfactory.

Mr. Warnerke said he understood that Mons. Lambert had a tissue made with texture purposely for enlargements.

After some general conversation on the subject of carbon, collodion, and albumen transparencies, in which it was remarked that it was generally acknowledged that carbon gave the best results, the difficulty was insisted on that the Autotype Company produced their transparencies by a secret process, and with special material not supplied to the public.

Mr. Foxlee said that the Company sold to the public the same tissue as they themselves used; the only things held back were certain little details of manipulation due to the operator.

Mr. Wilkinson said he believed that the carbon process would have been much more widely adopted years ago if the public had had to pay for it; but they had had liberty to practise it, and were, therefore, indifferent about it. The process had been published, with the exception of a little personal details and dodges of the operator.

Mr. Foxlee said that, nevertheless, without these details the public could not produce similar results.

In the course of further conversation on this point it was alleged that the secret process of the Company had been published in the Year-Books, and that the secret process of Mr. Edwards had also been published. After some further conversation it was agreed to ask Mr. Brooks to produce some transparencies by his method, and Mr. Wilkinson would prepare carbon transparencies from the same negatives. Mr. Foxlee would also try to bring some albumen transparencies. These were to be ready by the October meeting.

Desultory conversation on various subjects followed.

Mr. Wilkinson referred to the satisfactory action, in a friend's hands, of the developer described by Mr. Brooks at last meeting.

Mr. York said a sample made by himself, and a sample supplied by Mr. Brooks, had proved a complete failure.

Mr. Dunmore had similar experience.

Mr. Warnerke said it would not answer with intensification.

A discussion on the management of the library followed, and this was succeeded by a conversation on the reading of papers, initiated by Mr. Tulley.

A paper was announced for next meeting by Mr. Aldridge, "On Obstacles to Photographic Progress," and the proceedings then terminated.

Edinburgh Photographic Society.

The first out-door meeting of the season took place on Thursday, the 11th inst., in the grounds of Craigie Hall, the property of Mr. Hope Vere, but at the present time occupied by the Rev. Mr. Cooper. The morning looked somewhat dull and threatening, but, in spite of that, fully more than the usual number of members appeared at the rendezvous.

A proposition to postpone the excursion was made by some of the more timid members; but as faith in the "clerk of the weather" was loudly proclaimed by the more enthusiastic, the proposition was not entertained, and the party drove off in capital spirits at ten o'clock.

A halt was made at Cramond Bridge Hotel, where it was intended to put up the horses, and walk the remainder of the distance; but on learning that ample stabling existed at the house, it was resolved to drive all the way. On arriving at the principal entrance gate, it became evident that Craigie Hall is not often visited by such large, or probably such Bohemian-looking, parties, as they were assured by the lodge-keeper that they had made a mistake, and that it must be Dalmeny that they wanted to go to. The exhibition of Mr. Cooper's letter, however, put matters straight, and served as an "open sesame"; and after a pleasant drive through a pretty avenue of trees just bursting into foliage, the camping ground was reached.

Craigie Hall lies between four and five miles north-west of Edinburgh, on the banks of the Almond, and is well wooded;

some of the trees, especially some large geans at this season, are well worth the attention of the photographer. The house itself is not worth a plate. The glory of the place, from a photographic point of view, is the river Almond, and especially that portion which lies in front and a little to the left of the house. Here it takes a slight bend, and spreads out to a considerable breadth, and being shallow, and freely supplied with large boulders, very fine effects of light and shade are easily procured. An additional charm is given to the picture by a fall of three or four feet, over which the water flows, and then rushes with considerable rapidity amongst huge masses of rock. On the left, looking up, the bank is high and precipitous, and clothed with trees in considerable variety; and on the right, high above the stream, is erected a rustic summer house, with high peaked thatched roof, and ornamented somewhat grotesquely. Some hundred feet below the fall the river is crossed by an old stone bridge, of a sufficiently irregular style of masonry to enhance the effects in any picture of which it may form a part; while below the bridge, although somewhat difficult to get at, there are a succession of charming points from which good bits may be got. By this time the gloom of the morning had given place to brilliant sunshine, and as there was hardly sufficient wind to stir the leaves of the silvery birch, it seemed as if all nature had conspired to afford the wished-for opportunity to successfully inaugurate the out-door meetings of 1876.

In a short time cameras were unpacked and tripods set up, and each selecting for himself the points of view that pleased him most, fired away as if determined to make up for the lost time consequent on the dreary months of a Scottish winter.

It will, of course, be evident that, in a locality where so many fine points may be obtained almost without moving the tripod, a large number of plates may be exposed in a comparatively short time, and, consequently, a halt was called at an early period of the afternoon, as one at least was wanted for a group, and one or two for the auld brig at Cramond.

Mr. Panton and Mr. Crichton then grouped the members under the spreading branches of a fine gean tree, and each exposed a plate, in full confidence that a rapid rectilinear would, in about forty seconds, give a good negative on beer-and-albumen. The party then moved on to Cramond, and photographed the old bridge and several other interesting bits, including "Jock Howieson's house"; and as the hour was yet early, they spent the remainder of the time in a pleasant stroll down the banks of the river, some engaged in prospecting with a view to future visits, while others, of a technical turn of mind, visited several of the industrial establishments that owe their existence to the motive power furnished by the river. In one of these they were much interested in a new, or at least modern, method of turning the wooden shafts for shovels, including the bend near where they enter the iron socket; and in another with watching the process of paper-making by hand, probably the only place in Scotland where that operation is carried on in the old-fashioned way.

An adjournment was then made to the hotel, where a pleasant half-hour was spent in discussing the probabilities, or rather the certainties, of success, as, curiously enough, with the exception of a single emulsion plate, all were by the beer-and-albumen process.

By this time the horses were at the door, and the party started off for home, all highly pleased with the first out-door meeting, and agreeing to show the results at the ordinary meeting of the Society on the first Wednesday in June.

French Photographic Society.

A meeting of this Society was held on the 7th April, M. Peligot in the chair.

The President called attention to the great loss which the Society had experienced through the death of its president, M. Balard, and delivered a short biographical address.

M. Peligot then announced that His Majesty the King of Portugal had been graciously pleased to accept the honorary membership of the Society which had been offered to him.

The President also stated that he had received a communication from the Director of Fine Arts, begging the assistance of the French Photographic Society in producing a catalogue of all the art treasures in the country, many objects existing in churches and museums in the provinces of which some record was desirable. It was believed that the members of the Society could aid materially in securing a complete list of all valuable art objects which exist in France.

The Amsterdam Technological Society announced by letter that there would be an art exhibition at Utrecht this year, from 1st August to 30th September, at which the contributions of photographers would be welcome.

The Geographical Society forwarded a paper, which had been with them for some time, on the practice of photography in warm climates; it was decided that the same should appear in the *Bulletin*.

M. Van Monckhoven forwarded a note on carbon printing (in our next).

M. Fernand, of Lille, exhibited a new developing support for carbon pictures, which he had invented.

MM. Brauneck et Maier submitted to the Society some prints in greasy ink obtained by means of a peculiar process of their own, called *La Presse Rapide*. This press was capable, according to the inventors, of producing one thousand prints a day, while the ordinary hand press gave but sixty to eighty.

M. Perrot de Chaumeux read a digest of the foreign journals for the past month.

M. Davanne gave his experience of the sugar of lime developer recommended some time ago by M. Peligot. He employed it as an alkaline developer, and he found it acted rather more rapidly than other solutions; the formula he used was :—

Ordinary water	100 cub. cents.
White sugar	10 ,,
Slaked lime	an excess
Bromide of potassium	1 gramme

An amount of lime rather more than will dissolve is added. To use the developer, the plate is washed, and then to one hundred cubic cents. of water are added five of the sugar of lime, which is poured over the negative. When the preservative contains gallic or pyrogallic acid, the image appears, and gradually develops; two or three cubic centimetres of a ten per cent. solution of pyrogallic acid added to the lime liquid rapidly brings out the picture.

M. Perrot de Chaumeux said that the *Polytechnisches Journal* indicated a means of preparing orange and yellow chrome, which are employed for dark room windows and for coating the papers employed for wrapping round dry plates. Ten parts of acetate of lead are dissolved in ten parts of warm water, and then ten parts of cold water are added. Next, two parts of bichromate of potash are dissolved in ten parts of warm water, and then one or two parts of sulphuric acid are added, and ten parts of cold water. When the two solutions are cold they are gradually mixed together, shaking them the while. The yellow precipitate that is formed may be rendered darker by the addition of chloride of zinc or calcium. To secure an orange colour capable of resisting the action of alum and acid, two solutions are made, one consisting of ten parts of acetate of lead in ten parts of warm water, and the other of 3·8 parts of bichromate of potash in ten parts of warm water, in which, first of all, 3·6 parts of carbonate of soda have been dissolved. The two solutions are mixed, and boiled for half an hour.

M. de Damseaux announced that the Belgian Photographic Association make use of glycerine added to the collodion, in order to get wet plates to remain moist for some time. Eight to ten per cent. of glycerine is added; the exposure given must be a little longer than usual.

Dr. Gustav Fritsch furnished some micro-photographs of sections of the brains of fishes, produced by means of diffused light.

M. Cheri-Rousseau submitted some photographs coloured in a new style, which permitted of pictures being finished in a very rapid manner.

MM. Gougenheim et Forest exhibited some enamels, both of portraits and landscapes.

M. A. Chardon showed a large collection of micro-photographs obtained by Professor Moitessier, of Montpellier.

M. Prazmowski submitted some landscape lenses of novel construction.

M. Janssen exhibited his "Revolver Photographique," which he employed on the occasion of the transit of Venus observations.

The proceedings then terminated.

Talk in the Studio.

Photography at the Exhibition of Scientific Instruments.—In the exhibition of scientific apparatus and appliances there is a small but interesting collection of photographs, under the charge of Captain Abney. In the course of Her Majesty's visit the other day, she stopped to examine the examples of ceramic photography produced by Mr. Mayland, exclaiming, "Very beautiful!" as she examined each successive specimen. We shall describe the exhibition in our next.

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To Correspondents

T. J. Dixon.—The markings in question are very puzzling. We have been familiar with them for years, but have not satisfactorily determined the cause. A remedy which we have found beneficial consists in diluting the sensitive collodion with some plain collodion. A curious remedy we have heard described, but have not tried, consists in pouring a little collodion into the bath, and filtering. Keeping the plate moving laterally during the time of immersion is also at times useful.

G. D.—We should certainly expect the lens you mention to cover such a group on a plate eight and a-half by six and a-half with a reasonable size stop, especially if the group were arranged to suit the curve of the lens. As a rule, an ordinary single lens will cover a large distant group properly arranged, but the lens you mention ought to do it better. But you can do with a moderately small stop in taking such a group in the open air on a fine day.

C. A. M W.—The water you describe may not be an unwholesome water for household purposes, but it is not fit for photographic purposes, that is, for making silver solutions, or developers coming into contact with silver solutions. There is chloride of sodium, which would precipitate silver if any silver solution be present; or if an alkaline developer be used, it would also act as a restrainer. There are traces also of iron, also of organic matter, and a large proportion of carbonate of lime, which would also produce a precipitate. Possibly the addition of a little nitrate of silver, and sunning, might purify it sufficiently for photographic use.

Photo asks us to give him full particulars of the process of enamelling prints with gelatine and collodion, and also to give him a good formula for a platinum toning bath with working directions, in this column. The space occupied by such instructions as he desires would fully engage the entire space we devote to Answers to Correspondents, to the exclusion of other answers; and as we have repeatedly given the information he requires, this would be done for the benefit of a single reader, who either does not regularly read the Photographic News, or takes no care to note the information it contains. For enamelling, we have, in the News and in our Year-Books, published many articles, with full details, to which we must refer our reader; but we shall have pleasure in helping in regard to any individual difficulty he may find in carrying out those instructions. The enamelled surface sticking to the glass is a difficulty not uncommon to beginners. It may arise from several causes. If the plate glass is not perfectly cleaned it will happen. Sometimes it arises from the glass being imperfectly waxed. Sometimes it is caused by using the gelatine too hot. Sometimes it arises from drying the enamelled print on the glass by heat. Platinum in a toning bath is used much the same as gold; but the bichloride of platinum is first neutralized by means of carbonate of soda, and then a very slight trace of nitric acid added, just sufficient to give it an acid reaction.

H. M. Amateur.—It is, as you will readily understand, always a difficult matter to advise how to proceed in a case of which a secret formula is the basis. The paper in question we have always found good, and not difficult to obtain good tones with; but when it fails to yield good tones, it becomes at once difficult to decide whether the cause is in the the toning bath, the manipulations, or in the paper prepared by a secret formula. One cause of the tone of No. 2 being less satisfactory than No. 1 is, we should be disposed to think, in the negative, which is probably in No 2 a little less intense than No. 1, and thus admits of a somewhat less perfect reduction of silver in printing. To get fine tones, a really vigorous print, with a good reduction of silver, slightly bronzed in the deep blacks, is necessary. Failing this, the tone of the print is brown with light toning, and inky grey with deep toning. But it ought, we think, with a print like No. 2, to be possible to secure a rich purple-brown tint. We should try a ripe acetate bath, immersing the print as it comes from the printing frame, without washing between. Or we should write to the maker of the paper, who, knowing its constitution, might see where the cause of failure lay.

Comate.—The defect you describe is, undoubtedly, we should think, due to air-bubbles, and might easily arise from the tissue being too dry, and, therefore, not readily pliable.

B. L. D.—Your negative arrived in fragments, from which we cannot form any opinion of the retouching.

Albert F.—To succeed in colouring photographic enamels it is necessary to understand something technically of ceramic painting, as well as to possess artistic skill. It is necessary that each successive colouring shall be effected with colours requiring less heat to vitrefy than the former; or there would be, of course, danger of injuring the former by again fusing it. A knowledge of the pigments and their behaviour under firing would, of course, be imperative.

J. Worsnop's Tent.—Byron Carr is anxious for "the further information promised by Mr. J. Worsnop about his dark tent." He says:—"1st. How are the chemicals carried inside? 2nd. In what way is it fastened to the tripod? 3rd. How the cloth cover is packed away? I should very much like to make one; but, having never seen one, I scarcely know how to do so." We fear that, if our correspondent has never seen a dark tent, and is not apt in mechanical contrivances, it will be difficult to give him in writing all the information he asks; but possibly Mr. Worsnop will give him some further hints.

George Croughton.—Thanks In our next, with comments.

W. J. A. G.—Many thanks. We shall be glad to hear of your movements.

Captain T. W. Marten (Roorkee).—Subscription for Photographic News to December 31st, 1876, duly received, with thanks.

Several correspondents in our next.

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METEOROLOGICAL REPORT FOR APRIL.

BY WILLIAM HENRY WATSON.

Observations taken at Braystones, near Whitehaven, 36 feet above sea-level.

Date.	Barometric Pressure.			Temperature.			Direction of Wind at 9 a.m.	REMARKS.
	Morning.	Noon.	Night.	Morning.	Noon.	Night.		
1	29·33	29·46	29·53	46°	56°	44°	S.W.	Fair and sunny
2	29·60	29·63	29·76	44	55	43	S.W.	Fair and sunny
3	[illegible]	29·83	29·92	41	54	50	S.	Fair, but gloomy
4	30·00	30·05	30·11	50	55	50	S.	A little rain a.m. and p.m.
5	30·12	30·25	30·20	50	56·5	50	S.W.	Fair, but gloomy
6	30·12	30·11	30·10	51	60	56	S.S.W.	Fair, but gloomy
7	30·10	[illegible]	29·95	53	61	51	S.	Fair, generally sunny
8	29·73	29·64	29·53	47	61	50·5	S.W.	Rain this morn. and afternoon
9	29·41	29·4	29·30	45	54	49	W.S.W.	Showers of rain a.m. and p.m.
10	29·20	28·90	28·95	40	42	36	N.W.	Rain a.m. and p.m.
11	29·06	29·21	29·4	34·5	45	34	N.W.	Showers of snow a.m. and p.m.
12	29·45	29·51	29·50	34	46	37	N.	Showers of rain a.m. and p.m.
13	29·53	29·4	29·5	32	40	32	N.	A little rain this afternoon
14	29·60	29·7	29·75	37·5	45	35	N.W.	A little rain at noon
15	29·67	29·9	29·90	39	51	40	S.W.	Fair, but gloomy
16	29·87	—	29·61	45	56	40	S.W.	Fair and sunny
17	29·43	—	29·2	40	54	40	S.	Rain a.m. and p.m.
18	29·00	—	28·93	43	49	45	S.	Fair, but gloomy
19	28·7	28·62	28·70	46	50	44	S.W.	Showers of rain a.m. and p.m.
20	28·75	28·81	28·79	44	49	45·5	S.S.W.	Rain a.m. and p.m.
21	29·10	—	29·35	45	51	47	S.W.	Fair, but gloomy
22	29·45	29·56	29·60	46	45	43	W.	Fair, generally sunny
23	29·60	29·65	29·62	45	54	48	N.W.	Rain this afternoon
24	29·6	29·62	29·60	48	51	50	W.N.W.	A little rain a.m. and p.m.
25	29·60	29·63	29·7	44·5	54	47	N.W.	Fair, generally gloomy
26	29·76	29·80	29·76	46	52	54	S.W.	Rain this morning
27	29·68	29·50	29·45	44	51	52	S.W.	Fair and sunny
28	29·20	29·10	29·15	46	51	43	S.	Rain a.m. and p.m.
29	29·19	29·2	29·36	44	53	40	S.	Rain morning and afternoon
30	29·45	29·56	29·60	42	48	40	S.S.W.	Fair and sunny

Summary.

	Mornings.	Noons.	Nights.
Highest temperature	53°	61°	56°
Lowest ditto	32	40	32
Mean ditto	41	51·8	44·5

Mean of all observations ... ... 45·8
Number of days on which rain fell 16
Number of fair days 14
Number of fair days sunny 7
Number of days fair and gloomy 7

Erratum.—In the summary of my last report I find a slight error in the printing. For "number of days on which rain fell, 16," read "number of days on which rain fell, 19."

Note.—Rain is very much wanted here now; the grass is exceedingly short.

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PHOTOGRAPHS REGISTERED.

Mr. F. Downer, Watford.
Photograph of Mr. H[illegible] Coach (London and Watford) Changing Hor[illegible]

The Photographic News, May 26, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Carbon Enlargements v. Engravings—Recent Revolutions in the Studio.

Carbon Enlargements v. Engravings.—Carbon enlargements should be instrumental in securing for photography a satisfactory position in one important branch of art where it has not yet made good its footing. One sees now and then, in the library and dining-room, a pictorial photograph hanging against the walls, maybe one of Robinson's charming landscapes, or Rejlander's studies but compared to the number of engravings and lithographs that are met with, photography can scarcely be said to enter into the competition at all. We do not, of course, allude to photographic portraits, or images of some building or other, that may be of particular interest to the family upon whose walls they hang, but camera pictures with some art qualities, and of the same broad dimensions as our larger engravings. Such photographs as these printed in permanent pigments, so that the purchaser would have some guarantee of their durability, if only placed before the public properly, could not fail to find a ready sale. They would not be cheap wall pictures, we are ready to admit, except as compared to proof engravings, for the production of the enlargement would alone be a costly affair, while the photographer who produces the negative would require to be well paid, seeing that a good deal of pains and much forethought would be necessary in its production. A photograph that is to make a good wall picture must be of such a nature that it cannot all be seen at a glance. We do not want an object at which the spectator will exclaim: "How exceedingly curious!" or "Well, that is wonderful!" and then pass by. Before you consent to hang up a picture in your room permanently, you are always apt to consider like the Vicar of Wakefield's wife, whether it will wear well. A painter does not strive to produce something for momentary enjoyment, but a work for the eye to dwell upon, which will repay study by the discovery of fresh beauties not seen at a cursory inspection. And it must be so with photographs, if we are to hang them upon our walls. There must be something beyond a stretch of river, for example, with grassy banks on either side; such a scene, if well depicted, interests one for the moment, but without there are secondary points to engage the eye, one soon becomes satiated. A few cattle in the meadow or wading through the stream, a thatched farmhouse at one corner in the foreground, and on the opposite side wooded slope, seen in the distance, would add much to such a photograph. "But how is one to get such a combination?" some may ask. Well, that just constitutes a difficulty in the way of the photographer, just as the proper point from which the scene is to be taken represents another. A magnificent tree or an old mansion will enlarge very well, and give superb photographs; but they will not please for long; and, we repeat, without there is something more than can be seen at a first glance, there will never be many purchasers to be found. A man only buys a picture after he has studied it. But the good work that has been done by photographers already leads us to the firm belief that pictorial photographs will very shortly elbow their way into our rooms. They must necessarily be of large dimensions, and treat of bold subjects, to compete with engravings. Such pictures as Robinson, Gordon, Bedford, England, and others are in the habit of producing would be exceedingly suitable for the walls of the library and reception rooms, and the same may be said of many of the studies of Rejlander, Blanchard, &c. Mr. Robinson, as everybody knows, has already produced pictures such as we speak of, as also Mr. Earl, of Worcester; but from the circumstance, we believe, that these photographs are not sufficiently known to the public, and that they are printed in silver—for our experience is that people do not like giving two or three guineas for pictures that may fade in a few years—there has never been the demand for them that they deserved. We have no wish to decry the general run of engravings that one sees adorning the walls; but there are many that certainly fail in interest in comparison with some of the scenes from nature we have seen depicted by the photographer's art. We shall not be surprised, therefore, if ten years hence pictorial photographs are found beside engravings hanging upon the walls in most of our homes.

Recent Revolutions in the Studio.—To those little versed in the art of photography a visit to some of the modern studios must be a matter of surprise. The popular notion about the practice of photography is, that you cannot have too much light for your work, and hence the beginner often commences operations in a chamber as vivid and transparent as a cucumber frame. He is a little incommoded with the heat, because he only works when the sun shines, and the rapid setting of the collodion plate, as also with the vaporization in the studio of such volatile chemicals as he uses; but these he only takes to be the inherent disagreeables of the art. He works away with sweating hands and a perspiring forehead, and as he gradually progresses, he begins to find out that he will be doing better by hanging up a curtain here and there. Working on in this direction, photographers have of late built their studios only partially of glass; and there are some—and Mr. Blanchard's new studio is an example—which may be said to resemble the photographic laboratory, rather than the operating room. It would be too much to say, perhaps, that this gentleman actually employs a dark room to take photographs in; but at any rate, when one enters his studio, so beset is it with screens where the light really does come in that it is difficult at first sight to guess how the model gets illuminated at all. The only pane of glass that is quite transparent is not in the direction of the sitter at all, but falls against a screen placed but a yard from it. Again, overhead, not a single ray of direct light is admitted, and the small amount of little top side-light that enters is stopped to a great extent by the employment of corrugated glass; while a faint front-light comes from a window a very long way off indeed. As we have said before, the room has more the appearance of one that has been carefully screened to permit one to undertake operations away from the light, rather than that of an apartment in which the rays are to do their full amount of work. It is only when the sitter takes his place, and you look towards him, that you see that the only light that enters just falls in the right place, and that it is but excluded from the studio where it would be useless, or, perhaps, we ought to say, injurious. So that in early days, portrait photographers gave themselves a deal of useless trouble when they began with a glaring apartment full of light, which had afterwards to be shaded on every hand with curtains. Now the plan many photographers adopt is to place the sitter in almost darkness, and admit light from one point after another, until a due amount of it, coming from the most favourable quarters, has been admitted. In isolated cases, coloured glass has been employed in studios—as, for instance, in the case of M. Constant-Delessert, who experimented some time back, with considerable success, with rose-coloured glass; and in that of M. Angerer, the court-photographer at Vienna, who had a magnificent studio of blue glass especially constructed for him. But we believe that there are very few who now employ coloured glass in their ordinary work in the same way, as the number of portrait photographers are limited who work in apartments glazed on all sides. Photographers have seen many revolutions in their time, but none more marked than those that have taken place in the studio.

ON THE MEASUREMENT OF THE ACTINIC VALUE OF SUNLIGHT.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.A.S., F.C.S.*

THE President has announced a paper from me to-night, and I must endeavour to fulfil my promise to him to the best of my ability, though what I am going to talk about I am afraid will not interest many nearly so much as it would if it were purely photographic in its purport.

Solar physics are each day growing more important, and we seem to be on the eve of the discovery of some great law which is to show the connection that exists between our luminary and the earth, in so far as regards climatic changes and meteorology generally. I am aware that the President would cut off from meteorology the registration of the diurnal actinic value of sunlight; but I personally cannot quite agree to his dictum, as I would include in that category any subject that will throw a light on those disturbances in nature that we are almost daily accustomed to witness. It can scarcely be classed under the head of photography, though it is the result of photographic action. If there be a doubt as to the head of science under which those records should be classed, I would say leave them unclassed till such a time as they show their own position, and then let that branch of science adopt them as its own.

Within the last year a remarkable paper—"On the Heat of Sunshine at London during the twenty-four years 1855 to 1874, as registered by Campbell's Method"—was read before the Royal Society by Professors Roscoe and Balfour Stewart. I need not enter into the details of this imperfect method of registering the heat; suffice it to say, a hemispherical cavity was made in a block of wood, and a spherical lens was placed in this cavity in such a position that while its centre coincided with the centre of the cavity, its chief focus was at some point of the hemispherical concave surface, the exact point being determined by the direction in which the rays struck the lens.

When the sun shone, a portion of the wood was carbonized; and as the sun changes his position from hour to hour and day to day, different portions of the wood were acted upon each hour.

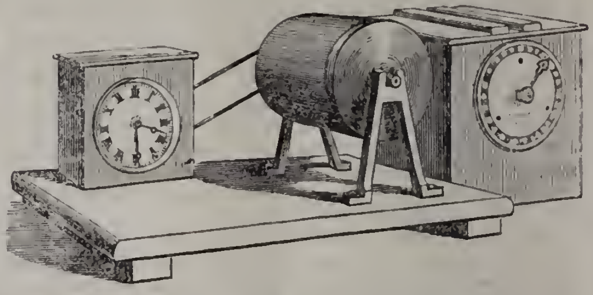
Each block was placed *in situ* for six months, and then changed. The value of burnt-out wood was determined by the Professors by filling up the hollows with a mixture of bees'-wax and olive oil, and weighing the blocks before and after the operation. By this means an approximate value of the sun's heat each half year was obtained. After a careful digest of the values thus obtained, it was shown that there was more solar heat in the years of maximum solar disturbances than in the minimum, which seems to accord with an observation by De la Rue that the number of fine days in which solar pictures can be taken follows the same law. Thus every eleven years we may infer that there will be a maximum of solar heat in London above the years between them. This rough method of ascertaining the solar heat is now replaced by a more delicate and perfect method due to Balfour Stewart; and it is considered advisable that the registration of the total diurnal actinic force of the sun should also be undertaken, to ascertain if this coincides with the times of solar heat maxima and minima. From one point of view it might be considered that when there are most solar spots then there will be the least light, as the dark patches on the sun's surface should then cause a loss. Again, from another point of view, the presence of sun spots may lead us to infer that there is more energy in the source of heat in the solar disc at those times, and consequently the diminished surface from which the most intense light proceeds is more than counterbalanced by the increased intensity of the light. The determination of this point must lead to a more accurate estimate of the force at work in the sun, and give a nearer approximation of the absolute heat of the sun. The last problem, I may state, seems to be in a fair way of solution by Lockyer; and all the observations obtained by Balfour Stewart's method for determining the solar heat and those for actinism will give certain data which will be of the highest importance to this investigation.

Professor Roscoe has introduced a very pretty instrument for the measurement of the chemical action of total daylight. It is described in a paper read February 5, 1874, before the Royal Society; and, owing to his kindness, I have had the instrument at work at Chatham during the last eight months. It is dependent on the exposure of a small disc of paper to sunlight. Each hour there are ten small discs exposed, during times varying from two to thirty-two seconds. Each disc is obtained by causing a strip of paper to move automatically before a circular aperture. Thus the paper moves a certain distance, then stops and receives the exposure, and then moves forward again.

At the end of the day one or more of these insolations is taken and compared with a graduated tint, such as I have here, and the value noted. The integral of the sunlight is thus obtained, though the process is slightly laborious, taking an hour for the reading, as each comparison is repeated three times, and in each hour two exposures are read; thus in ten hours' daylight sixty readings are necessary.

The small instrument I have here is not meant to supersede the above, but simply to enable those who cannot afford the more expensive instrument, and the time for reading it, to register the chemical value of total daylight in a simple manner.

Here we have a cylinder revolving on a central axis, covered by a box in which there is a narrow slit one-eighth of an inch in breadth; over this is a flat graduated glass obtained photographically. A pulley attached to the cylinder is connected by a band with the drum of an ordinary 10s. French clock. The cylinder, covered with sensitized paper, revolves once every twenty-four hours. When placed in the daylight the photographic action takes place through the glass wedge, and according to the intensity so it blackens the paper longitudinally. The paper is prepared according to Roscoe's method described in the *Philosophical Transactions* for 1865, by which means a uniformly sensitive surface is obtained. Unfortunately, the paper thus prepared is excessively liable to discolour when kept. As I have had no opportunity of getting a reading since last Thursday, I have brought two registrations on permanent sensitized paper, which were taken to try the instrument now before you. The effects of cloud are well visible, the different lights and shades showing whether the sun was obscured or not. The reading of the results is now to be described. In a yellow light the drum or cylinder is removed and placed in the supports of the whirling apparatus, the band is placed over the little pulley, and by means of the large wheel the cylinder is made to rotate about thirty times a second. This rapid rate of revolution integrates the different tints and gives a mean tint. I have here four tints of known value, and these are compared in monochromatic light produced by the sodium flame with the graduated tint on the rotating cylinder



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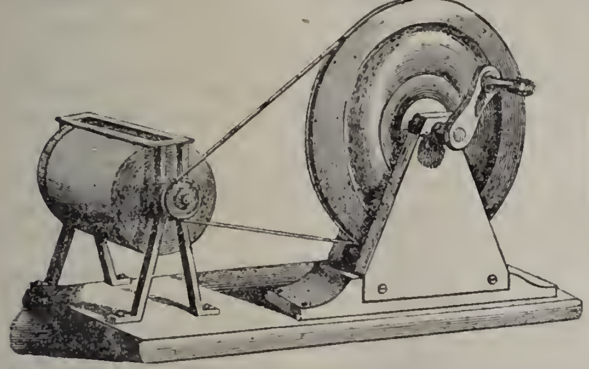
* Read before the Photographic Society of Great Britain.

Where these correspond, a reading along the supporting bar is taken, which shows to which portion of the graduated glass strip the mean value of the darkening action is equivalent. The four readings are noted, and the mean of these taken.

The reason why four tints are read is, that twice or three times the intensity of sunlight admitted does not mean twice or three times the blackening of the paper, as I have shown in a paper in the *Philosophical Magazine* for 1874; but by distributing the error likely to arise on each side of a probable mean, the resulting reading will be very nearly correct.

Now comes the question, how is the graduation of these comparison strips effected? It is in this way. A disc of wood is taken, and out of it is cut a certain portion or portions, so that if it be caused to revolve in contact with a sheet of sensitive paper the graduation proceeds in accordance with the time of exposure. Thus at a short distance from the centre the paper receives no exposure, whilst half way between that and the outer portion of the revolving disc it receives half the exposure that the totally exposed paper would receive, and so on. The proper portions of this graduated tint are taken and employed.



Another question that arises is, How can it be certain that the same standard is always maintained? This is easily effected by exposing a dry plate in the same manner, and developing it and toning with platinum, and calling this the standard negative. Paper exposed under this can always be printed to the depth, so that a line marked in the most opaque part of it is just visible.

Another method of attaining the same object is by exposing chloride of silver paper for an hour at a fixed distance from a standard argand burner, consuming a known quantity of gas of a certain candle power, or else by using a paraffine lamp with a flame of a certain height and breadth. Roscoe obtains his by mixing a certain proportion of zinc oxide with lampblack. The standard is, at the best, empirical, however, and the most satisfactory way would be to have a graduated tint fixed with hyposulphite of soda, which should only be used for comparisons of other tints to be employed in the readings. The tints I use are on the same standard as Roscoe's, and thus our readings are comparable with those taken at Kew and Manchester.

The original instrument I made myself. I obtained a tin cylinder made out of a biscuit box. Holes were pierced in the centre of the lid and bottom, and a thick wire soldered in. Out of a couple of pieces of sheet iron grooves were cut for the axis, and a small pulley turned of the same size as the drum of the clock. The latter was placed in position, and a silk thread passed over it and over the pulley. A cardboard box was made to answer the purpose of the wooden box of this instrument, and the apparatus was complete. The exposure was made under glass (preferably a dome shape), which protected it from wet. Those who do not care for appearance can make one in a similar manner, and it will be effective, though the cost of that before you is small.

For the last five years I have obtained registrations of the action of sunlight by hand at different times of the day, but now I think that the records will be much more perfect, and I shall be delighted to hear that any one else will take up similar observations in different parts of the globe, for I am confident that when the work of a few years is tabulated much light will be thrown upon solar physics by it.

◆

AN OXYGEN RETORT.

BY M. NOTON.*

I have to show you, to-night, some new machinery for obtaining oxygen by feeding the ordinary conical (or a special) retort with dry, powdered chlorate of potash and manganese, as the gas is wanted.

Before the apparatus was ready and tried I had made a drawing, and had also started to write out the usual "paper," as I expected all would be right; but I found afterwards I had been counting my chickens rather too soon. There not being time, before the meeting, to make the required alterations in order to remedy the defect, I have brought the machine as it is, and will set it to work presently. Not having an ordinary conical retort to operate upon I have provided a substitute. The body of the retort is a small cast-iron glue-kettle, seated in a cast-iron ring, ; this ring will be the top of a three-legged stool, sufficiently high to admit an aerated gas burner underneath, for heating the bottom of the kettle. The mouth of the kettle is closed by a flat lid, fitted air-tight, provided with a central inlet for the chlorate, and a smaller outlet for the oxygen; this lid is held down by two bolts passing through lugs and the ring under the kettle, forming, as it were, a pair of clams. This arrangement does very well, and gives great facility for washing out, drying, and seeing the inside of the retort.

Above the lid of the retort is a horizontal cylinder three inches long and one inch and three-eighths bore, containing a brass screw one inch and a-quarter in diameter, half-inch pitch; one end of the cylinder is closed, the other has a flange, lid, and stuffing-box, through which the screw-shaft passes. Underneath the front end of the cylinder a conical branch connects to the lid of the retort. Above the closed back end there is an inlet branch connecting the cylinder to a hopper containing the dry powdered chlorate—the "hopper" being, in this case, a pint bitter-ale bottle, for the sake of its transparency. By rotating the screw the dry chlorate is drawn forwards and dropped into the retort. The action is quite satisfactory up to a certain point, as I shall show you, the delivery being limited only by the contents of the hopper.

The retort being now connected, and getting hot, on turning the screw I feed in some chlorate; oxygen begins to be liberated, and bubbles through the water in the Woulfe's bottle on the table, as a matter of course. But an enemy is creeping up to stop this game. Direct experiment proves that the cylinder is too near the source of heat; the cylinder and screw get hot; the chlorate partly decomposes, fastens to the screw, chokes it, and prevents it from working properly.

The distance from the bottom of the retort to the centre of the screw-shaft is only four-and-three-quarter inches, while in a common conical one it would be about double this, so that there is a little hope left of a better result some day. Instead of a flat lid, I ought to have a cone that will raise the screw-shaft three inches or more higher.

The idea of using a glue-kettle as a retort is not a recent one, for I mentioned it to Mr. Winstanley when we had the phosphorus light on, one being used then as a boiler for the phosphorus.

Now, all this has been done with a view of saving the making of the plugs, and I am reminded with a delightful (?) sensation that I have "jumped out of the frying-pan into the fire" by causing more work to be done amongst, probably, five or six hundred people in partial darkness than is required when using plugs. Whether this be so, or not, will depend upon the ability to keep the screw clean, which has yet to be accomplished: so there I must leave it for the present.

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* Read before the Manchester Photographic Society

Believing that a really good cast-iron substitute may be made for the ordinary sheet-iron, copper, or mercury bottle retorts, I have made a drawing, full size, of a new kettle I have which holds two pounds seven ounces of water. Cast-iron will last much longer than any of the others; the facility for cleaning out cannot be better. From the top of the cone to the bottom outside of the kettle is eight inches; from this a scale may be made for measuring the other parts.

A FEW NOTES ON DRY-PLATE PHOTOGRAPHY: BATH *V.* EMULSION.

BY W. T. BURROWS.*

Of course this process, like all or most of the dry processes, can be worked much quicker by the strong alkaline development than by the old method with pyro and silver. However, my best results have been made by the old method as originally introduced by Major Russell, "which is about six times as slow as the wet."

For the development mix the following solutions:—

Solution A.—Pyrogallic acid	...	96 grains
Absolute alcohol	...	1 ounce
,, B.—Nitrate of silver	...	15 grains
Citric acid ...	...	20 ,,
Water	...	1 ounce.

More of the water in summer.

Take ten drops of solution A, which represents about two grains of pyro., in distilled water one ounce. This is for a twelve by ten plate. The pyro. is best measured by one of Chalk's dropping-bottles, procurable at the establishments of most druggists. They are much used for medicinal purposes, and are the best of all the many forms of dropping-bottles in the market. With this two-grain solution of plain pyro. flow the plate—of course, after having carefully wetted it all over with distilled water. If the plate have been timed all right in the exposure—and there is a great latitude in that—the image will partially appear, but in some instances no trace of the image appears at all with plain pyro. However, be careful in adding silver. Begin by dropping one drop of solution B into the measure containing the plain pyro., which starts the development immediately it is poured on the plate. Add no more of solution B until every particle of detail is out; but if it refuse to come, from under-exposure, flow the plate with hot water; also, mix the next dose of pyro. developer with hot water, and flow the plate again. In many instances, by raising the temperature in this manner, you may get out the detail, when by the ordinary method very little would appear at all. When you have got out all the detail the intensity rapidly progresses on the addition of a few drops more of silver solution B, which must be added very carefully a little at a time. Fix in the ordinary way with—

Hyposulphite of soda ...	...	1 ounce
Water	...	6 ounces.

If you should have to intensify again after fixing—which is very often the case with me—wash the plate well under the tap; then flow it, while wet, with a weak solution of tincture of iodine in water, till it is about the colour of sherry; then wash and re-intensify with pyro. and silver as before. By this method you prevent stains, which, in many instances, occur when intensifying after fixing with hypo. Before adopting this method, I found my negatives change colour very much indeed, and were also subject to stains. Very often the colour was a very non-actinic yellow. There are one or two examples, by both methods, which I will pass round for the inspection of the members. In many instances, if I could only have had the colour without resorting to the re-intensifying process, it would have been sufficient.

I have very little more to add in connection with this process. I have no doubt many of you will say that it is old; that I have communicated nothing new or of much importance; and also that it has been superseded by others which are better. However, give it a trial, and I will be bound to say that you succeed with this dry process when you may have failed with many others. When I began to jot down these few notes, I intended to give a general *resume* of various processes with which I have succeeded in producing good results; but on sitting down to make the notes, I found that one has so much to say about each individual process, and his own special manner of working it, explaining minutely every little dodge which he picks up as he goes along in his study of dry-plate photography, that I found my notes would become too extended.

There is another bath process to which I fully intended drawing your especial attention, namely, the gum-gallic process, as worked by Mr. R. Manners Gordon. Colonel Stuart Wortley—no mean authority in dry-plate work—says of it that it is the best of all dry processes with the bath. I worked it with the strong alkaline development, and found it as near as possible as quick as wet collodion. I have some negatives taken with a six-inch single view lens, quarter-inch stop, in twenty seconds. However, as you wish me to give you my way of using the Liverpool Dry-Plate Company's emulsion, I shall have great pleasure in referring to the gum-gallic process and also several others on some future occasion; that is, if it be the wish of the members, and if my doing so will give any impetus to dry-plate photography, especially among the junior members of the Society.

To make my notes as short as possible, I will now give you merely an outline of my way of using the Liverpool emulsion. I do not confine myself to the letter of the law laid down by the Company in their printed directions sent out with every bottle of emulsion; still their way may be best, and it may be my want of skill in manipulating and working out their instructions which makes me succeed better with my own modification. However, I am quite certain that the best negatives in my possession have been made by the method I will now explain; and I may add that they have been very often admired by brother amateurs who have not succeeded so well by following literally the Company's instructions.

I first clean the plate well, then coat with my old dilute albumen as mentioned for the tannin process, and then dry in my drying-box. The Company now recommend india-rubber in benzole as a substratum; but I have experienced no trouble as yet with my old albumen solution. This is soon done. We are now ready for coating the plate with emulsion. "This is grand! Away with baths and dishes and preservatives! Hurrah! Hurrah!" cry the amateurs who are constantly bothered by never finding their chemicals twice alike, when desiring to prepare a few plates; while, if a few weeks of bad weather have intervened, your constantly changing chemicals are all wrong and out of order. Still I think it is better for a beginner to work a bath process, and get good results before going in for emulsion; he will get good schooling, which he will stand in need of many a time. I was often annoyed with emulsion work when making my own emulsion; but, having of late years very little time to spare from business, I hailed with pleasure the announcement that the Company would prepare an emulsion to keep indefinitely and require no preservative. On trial I found it first-rate, and that prepared last season better, I think, than the former. It also gave such an opaque film as to require no backing. If your emulsion bottle has been standing unused for a long time, let it have a good shaking—not just an hour or half-an-hour before using, as directed, but several times. I found some of mine to give transparent spots; it was a sample I had by me for a year. It had been well shaken up as directed, and I was going to pitch it out as a bad lot: but on shaking it up several times next day, and trying another plate, it gave a film without a speck. On examining the spots on the spoiled plate with a microscope, I found that in the centre of each spot was a small particle of what I took to be undissolved gum of some kind—perhaps gum ammoniacum. I am told this gum is used in making the emulsion. However, next day they did not exist; so, for the sake of saving a little trouble, do not omit to shake the bottle well.

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* Continued from page 231.

Now begin by uncovering the neck, &c., of the emulsion bottle; and have also ready a clean bottle, in order that in coating the plate you can return the surplus emulsion off the plate into it, so that if you do gather particles of dust, &c., or anything else, you do not run it back into the bottle you are using. My drying-box, as I said before, holds six twelve by ten plates. I coat the six plates, put them in the rack before mentioned, and then pass the whole into the box, light up my gas stove, and in about forty minutes they are perfectly dry. I then pack them away in my double dark slides. The trouble of preparing these plates as compared with the bath ones is very small. I find these plates about the same as the tannin for rapidity.

I begin the development by wetting the plate with ordinary alcohol. Methylated spirit will do. Now wash thoroughly under the tap until all greasiness disappears; then, according to the Company's directions, I pour on a solution of pyrogallic acid, three to five grains to the ounce, and let it stay on for a minute or more. You can now form a pretty good idea of the exposure. If the image appears in all the well-lighted parts, add to the pyro two minims of a solution of bromide of potassium ten grains to the ounce, and flow it over the plate two or three times, when add, one or two drops at a time, ammonia ·880 of the strength of one drachm to one ounce of water. When the details are all out, add equal quantities of bromide and ammonia solution, and continue the development until the density is sufficient. In many instances I have found a difficulty in getting density by the alkaline method, so that now, in every instance, as soon as I get all image out, and lacking nothing but density, I wash the lot off the plate, and begin with the ordinary pyro. and silver, when the density comes up quickly without fear of fog, and free from stains of any kind. I do not say that my mode is the best, only with me it succeeds best. All the twelve by ten plates before you are done in that way.

I have very little more to add, excepting that if you lack density after fixing with hypo, give a slight dose of tincture of iodine in water, about the colour of sherry; then wash well, re-intensify in the usual manner, and your negatives will be as clean as possible, and free from stains of any kind, bearing comparison, as to quality, with bath plates by any process. I have trespassed upon your time much longer than I originally intended, and, I am afraid, with a good deal of old matter with which you are all acquainted; but the fact is, we must keep dragging it up, and keeping it constantly before the eyes of the junior students of dry-plate photography.

WATER USED IN CARBON PRINTING.

By Dr. D. van Monckhoven.*

Until the present moment, no attention seems to have been paid to the influence of the acidity or alkalinity of the waters employed in the manipulation of carbon prints, whether the water is used for soaking the tissue before transfer to paper or glass, or for developing the image. And yet the matter is one of supreme importance, as the following experiments prove.

From one and the same roll of tissue prepared with gelatine, sugar, indian ink, and traces of purpureine and alizarine, to give it a warm tone, which was sensitized on an aqueous solution of bichromate of potash, several small pieces were cut and exposed in the ordinary way under a negative. Some of these pieces were after printing put into pure cold water, others into pure water to which half per cent. of carb. of soda had been added, and others again in pure water with which half per cent. of sulph. acid had been mixed. The pieces of tissue thus impregnated with water were severally applied to a surface of normal collodion, which had first of all been washed to remove all traces of grease. The images were then developed with the same waters, respectively neutral, alkaline, and acid, raised to 40° C.

A marked difference was visible in the results. When the tissue was immersed in pure water it buckled, and after a sojourn of a minute and a half in the bath, became flat again. In alkaline water the same effect is produced in a few seconds; while in the case of acid water, a much longer time is necessary, amounting to something like four minutes. To the touch, the tissues are also different. In alkaline water the tissue is supple and slimy; in acid water it is hard and rough. The alkaline tissue adheres more firmly to the glass, whereas tissue soaked in acid water requires the application of the squeegee several times to make it cling thoroughly.

In developing the tissues, the difference between the two is more marked still. In the case of warm alkaline water the paper backing detaches itself almost immediately from the glass; with neutral water the operation is longer, and in the case of acid water, longer still.

It is the same with the actual washing away of the unchanged pigment. The images treated with alkaline water develop very rapidly, while those treated with acid water take at least six times as long. But, on the other hand, alkaline water tends to produce, and really does produce if too strongly alkaline, an appearance of green in the image, as if a fine thread covered the surface. The image when dry is rugged to the touch, but only in the case of the amount of alkali in the water being large.

Images developed in acid water are very fine and perfectly transparent; but it is difficult to free them entirely from the unchanged pigment.

Finally, what is very curious is, that the colour of the images is greatly modified by the action of acid water. The pigment contained in the tissue seems to assume a different molecular aggregation than in the case of neutral or alkaline waters. Generally speaking, the images developed by acid water assume a darker tone.

All the same effects are produced equally if the bichromate of potash bath is rendered alkaline or acid. For purposes of experiment, we have made use of three baths: the first acidified by means of sulph. acid; the second prepared with ordinary water; and the third containing carb. of soda.

In the acid bath, the tissue becomes hard and rough. It is necessary that it should be left for at least ten minutes (at a temperature of 15° C.) before it is completely saturated. In the alkaline bath the tissue is saturated in the space of five minutes, and an intermediate time is necessary in the case of the neutral bath. In the subsequent operations the same results are produced as those described above.

We have endeavoured to discover what are the most favourable conditions to ensure success in practical work, and have come to the following conclusions:—That in the case of a bichromate bath of 10 litres containing 300 grammes of bichromate, 5 cubic centimetres of caustic ammonia should be added. Into the water in which the tissue is soaked before transfer, 2 cubic centimetres of ammonia should be put for every 5 litres of ordinary water. The water should gradually turn red litmus paper to a bluish tint. The warm water employed for development should have the same amount of ammonia added to it. In the case of transparencies upon glass, the employment of acidified water, in the proportion of one part of sulph. acid to 1,000 parts water, seems to give a much greater degree of fineness. I prefer the use of ammonia to that of soda or potash, because the latter often precipitates the lime contained in the water.

It would be well if others were to repeat my experiments.

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* Read before the French Photographic Society.

The Photographic News.

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THE FADING OF SILVER PRINTS.

At every step of further extended enquiry into the fading of silver prints, the question becomes more perplexing and less satisfactory. A careful examination of much evidence, and the opinions of various able men, lead to a conclusion that the use of decomposed albumen is a fertile source of fading in prints, and that by avoiding the use of mal-odorous albumenized paper, at least one serious element of instability will be removed. No sooner is this position established than another eminent portraitist calls our attention to the fact, before recorded in these columns, that the most permanent batch of silver prints he ever produced were printed on German paper, so offensive in smell from the use of stale albumen that the printing-room was intolerable all the time the paper was in use.* Again, we point to many fine prints of large pictures which, having been produced with due care, are in perfect condition, and conclude that if precision and care are used in all the operations of silver printing, the results may be regarded as permanent. This position appears to be fairly supported by facts, when we receive a communication from Mr. Croughton, accompanied by a couple of mounted silver prints from enlarged negatives. These have been produced with every care, as certain parts of the prints show; but they are, nevertheless, the victims of a leprous taint which utterly destroys the pictures. It so happens that the background in the prints is larger than is required, and having been mounted on cards smaller than the print, about an inch of the latter overhangs the mounting board, not having been cut off. This unmounted portion is in perfect condition, whilst the part mounted on the card is covered with myriads of small yellow spots. The mounting-board is at fault, but who shall know it until the mischief is done? The inevitable moral—which we draw somewhat unwillingly, nevertheless—is, that a material so susceptible to destructive agencies as finely-reduced silver is not a safe material for producing pictures of value. In another case a similar moral is enforced. Our attention is called to a very valuable print, produced with great care, and retaining its colour and brilliancy perfectly. But, through a crack in the backboard, the atmosphere, and the sulphurous vapours with which in a large town it is charged, have got access to the print, and a yellow line of sulphide of silver follows the line of crack in the backboard, marking the noxious action, whilst the print generally is in good condition. This picture, it may be said, was not as well protected as it should have been. This is true; but a picture formed of a less susceptible material might have been soiled at the back by smoke and dust, but would not have been irretrievably disfigured on the face of the picture by the jaundiced tint which sulphur imparts to silver in a fine state of sub-division. Facts like these with many persons sweep aside all discussion; they decline to encounter the possibilities which may render unavailing all the care and pains bestowed in securing the primary conditions of permanency, and with Mr. Croughton, whose letter appears in another column, they exclaim, "Henceforth, for all pictures worth preserving, we rely no more on silver, but adopt carbon."

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* A communication on this subject will appear in our next.—Ed.

A PHOTOGRAPHIC EXHIBITION AT EDINBURGH.

The Edinburgh Photographic Society contemplates holding at the end of the year a photographic exhibition of an unusually complete and comprehensive character. The galleries of the Scottish Royal Academy have been granted by the Government for the occasion, thus lending the exhibition especial prestige, and affording ample space far a display of the most comprehensive character. The Edinburgh Society has always been an admirable type of activity and earnestness. It has been what our Yankee friends would style a "live" society, and we do not doubt that the exhibition its members contemplate will illustrate their vitality and enterprise. But the most perfect plans and the best possible management in an exhibition will be of no avail without the co-operation of photographers generally in sending contributions, and we therefore thus early bespeak an interest amongst photographers in the exhibition, which will open in December. One of the aims of the Society, we understand, is to illustrate the step-by-step progress of several of the popular processes, giving a view of their historical and of their technical phases. Apparatus and material, as well as pictures, will form part of the display. In short, this will have features distinct from an annual exhibition like that held by the London Society, and will properly comprehend many things beyond the pictures of the year. It is a long time since an exhibition was held in Scotland, and we hope that this one will in excellence and interest be worthy of "mine own romantic town," as Sir Walter Scott was fond of calling the modern Athens.

PHOTOGRAPHY AT THE LOAN EXHIBITION AT SOUTH KENSINGTON.

A Loan Exhibition of scientific apparatus and illustrations and appliances of science is now open, under the direction of the Science and Art Department at South Kensington, a portion of the galleries of the late International Exhibition buildings being devoted to a display of the contributions. The illustrations of photographic science are neither so extensive nor complete as might have been desired, nor are these arranged so as to give them their highest interest and value. One of the difficulties which beset such a display consists in the necessity of placing the majority of the contributions in glass cases, inaccessible for careful examination. But this drawback renders it the more desirable that, so far as a glass case will permit, the objects should be well displayed, duly numbered for reference to the catalogue, and that some sequence and order in the numbering should be adopted. Here many of the objects are so placed as to cover each other, many are not numbered at all, and in other cases the arrangement of numbers is not in sequential order. Probably much of this is due to late arrival of contributions, and will be subject to early revision.

Carefully arranged examples of various processes with their special appliances, and illustrations of the various stages of the processes fully labelled or numbered with description in the catalogue, might possess a valuable educational interest, which at present this department, at least, of the exhibition lacks. Nevertheless, there are many historical specimens displayed which will well repay a visit to the Exhibition galleries. Here are early Daguerreotypes by Daguerre, and specimens of several early photo-engraving processes. The first known photograph on glass, taken by Sir John Herschell on a coating of chloride of silver precipitated on the glass. A series of specimens illustrating the history of photography, contributed by the French Photographic Society, will well repay examination. Some very choice photo-enamels by Mr. Mayland will interest many. Photo-engraving, and pho lithographic processes, ancient and modern, are illustrated, as are the Autotype and Woodbury processes. Several modern novelties, such as the "Nitrotype" process of Edwards and Wright, and the Platinum Printing process of W. Willis, jun., are catalogued, but the examples were not visible or accessible. There is a good collection of examples of Photochromy by M. Vidal; but the visitor must look for these in another room adjoining the photographic department. Many of them are very fine, especially as specimens of decorative photographic art, the process especially lending itself to rich ornamentation in draperies and borders. There are also examples of various kinds of apparatus used in photography.

The most satisfactory work in connection with the exhibition is a brief, comprehensive paper on photographic printing processes, contributed to the hand-book of the exhibition by Captain Abney, R.E., which we here reproduce:—

"White light, and certain of its coloured components, have the power of splitting up into simpler forms the molecules of certain kinds of matter, in a manner analogous to that possessed by heat.

"In some cases the change is only effected after very prolonged exposure, as in the case of certain kinds of glass, and of the aniline dyes, whilst in others it is very rapid. The latter class of bodies are impressed into the service of photography.

"The bodies most generally known to be sensitive to the action of the luminous rays are compounds of silver, such as the iodide, chloride, and its more complex organic salts.

"The light separates these into more elementary forms, and when it is controlled by a lens, or by being passed through a photographic negative, a picture can be obtained formed entirely of metallic silver.

"The earliest known photographs (by Wedgwood) were produced on silver chloride. Sir John Herschell, among others, experimented with silver chloride, allowing, in some instances, a fine precipitate of this salt to be deposited by subsidence on glass. When washed with a dilute solution of silver nitrate, and dried, he exposed the sensitive layer in the camera. The picture of the 40-foot telescope that is exhibited is the earliest known photograph on glass, having been obtained in 1839. At a later date, Nicéphore de Niépce discovered that the bitumen of Judea, or asphaltum, when exposed to light, became insoluble in the usual menstrua employed for dissolving it. An early picture, produced in the camera, of Kew Church, of the date of 1824, is still preserved in the British Museum. This discovery of Niépce's is still utilized in certain photo-engraving processes, and although the method is slow, the resulting images have certain qualities of the highest importance. Of late years what is erroneously termed carbon printing has been much adopted by photographers. If a solution of a dichromate of an alkali be mixed with certain organic compounds, such as gelatine or gum, dried, and be then exposed to light, a singular change takes place; the chromic salt gives up a certain proportion of its oxygen to the organic bodies, and the new compound thus formed becomes insoluble in water. If paper be coated with a mixture of gelatine, pigment of any kind, and potassium dichromate, and be exposed under an ordinary photographic negative, the gelatine will become insoluble to a depth dependent on the intensity of the light passing through the various portions of the negative, nearly all the surface of the gelatine next the glass becoming insoluble. If the paper thus prepared and exposed were placed in hot water the soluble gelatine imprisoned between the paper and the exterior insoluble surface of the film could not be washed away; an artifice is therefore necessary to enable the picture to be developed. This consists in causing the film to adhere to a temporary support, placing it in warm water, and then peeling away the paper. All the gelatine not insoluble can now be washed away, and the picture is fully developed. When thus finished it can again be transferred to paper, or can be left on the support; in the latter case, in order to get a picture in proper position, the negative must be what is called "reversed." In this class of printing the image is formed of gelatine, and the intensity is mostly dependent on the character of the pigment it contains. The autotype process is an example of this kind of photographic printing. If an image formed of gelatine be supported on a thin homogeneous film, an impression of it can be taken on a soft metal plate, as in "nature printing." When coloured liquid gelatine is run into the mould thus formed, and paper backed by a perfectly flat hard plate is brought down on its surface, the excess of coloured material is squeezed out. The paper can be removed, bearing the "set" gelatine image with it. Such is a bare outline of the Woodbury Process, specimens of which, with a gelatine film and mould, are shown.

"There has been a further extension of this action of the dichromates of the alkalies on gelatine during the last few years. Not only does the gelatine become insoluble when acted upon by light, but it refuses to absorb water. Advantage is taken of this fact to prepare surfaces from which pictures can be printed in printers' inks in an ordinary type or lithographic press. If a glass plate be coated with a mixture of gelatine and potassium dichromate (with an addition of either gum resin or chrome alum to give the film hardness), and be then exposed to the action of light that passes through a negative, the different portions of the film of gelatine will have become absorbent of water in the exact proportion to the intensity of the light acting through the negative. If the plate be plunged into cold water for a time, and, after the excess of water has been sponged off, a soft roller coated with greasy ink be passed over the gelatine, the full depth of ink will adhere to those portions of the image which have been strongly acted upon by light, and the different shades of the picture will be formed by the varying proportions of greasy ink that the film of gelatine is capable of holding, a power that is altogether dependent on the intensity of the light that has acted on it, and the consequent varying absorption of water. When a picture is thus formed in greasy ink, the gelatine film (which may be supported on the original glass plate or on a metal plate) may be placed in the printing-press, paper laid on it, and an impression taken. The surface may then be damped and rolled up again, and more impressions pulled. The Albertype, heliotype, pantotype, and the autotype mechanical processes, are all of them modifications of the above.

Photo-lithography is equally dependent on the reducing action of light on dichromated gelatine. In some processes the gelatine with which paper is coated, and which has not been acted upon by light, is washed away; the whole surface of the film having been coated with a layer of greasy ink subsequent to its exposure beneath a negative picture of a plan or map. In such examples the lines are formed of altered gelatine holding on its surface a layer of fine ink. The transfer, as this finished print is termed, is placed on a lithographic stone, pulled through the lithographic press, and impressions taken in the usual way.

"When paper is washed over with the dichromate of an alkali, dried, and submitted to the vapour of aniline, a blackening will be apparent. When light, however, has reduced the chromic salt, the surface will remain unchanged. In Willis's aniline process advantage is taken of this reaction. A map or plan is placed over the sensitized paper, and after exposure to light, it is submitted to the vapour of aniline. A print is thus obtained at one operation without the aid of a negative picture.

"The methods of producing relief blocks for setting up types by means of photography are various. One of the most successful is by exposing a zinc plate coated with asphaltum beneath a negative, and then dissolving away those portions unchanged by light. The zinc, which is uncovered, is acted upon by acid, and after certain precautions are taken, a depth is obtained sufficient to allow an impression to be taken in the printing press as if it were a woodcut. Gillot's is a good example of a photo-relief process.

"There are other metallic and organic compounds which are acted upon by light. The ferric and uranic salts are all more or less reduced to the ferrous and uranous state when in the presence of organic matter, such as paper, gelatine, &c. Some examples of early prints produced by their aid will be found in the exhibition.

"Vidal's polychromatic process is a carbon process. A negative of the subject is first obtained, and others are reproduced from it, the number depending on the number of colours to be printed. When it is desired that any portion of a print should have some particular tint, one of the negatives is utilised, and all but the required portions of it painted out with any opaque paint. A gelatine picture of the necessary tint is printed, and, by means of a system of registration, is placed accurately over a print of the whole subject, which has been previously made in neutral or other suitable colour as a ground. Thus, one after another, the films of various transparent colours are superimposed till the polychromatic picture is built up. The process is analogous to chromo-lithography."

PHOTOGRAPHY AT THE PHILADELPHIA EXHIBITION.

A special feature of the International Exhibition held in Philadelphia is the erection, in many cases, of distinct halls for the display of the products of special arts and sciences. We find in the *Scientific American* details of the Photographic Hall erected for the display of photographic contributions from all parts of the world.

"It covers a space of 258 feet long by 107 wide, its length lying east to west. The interior is fitted up with screens for the exhibition of photographs; these are twenty-eight in number, and four of them are 19 feet long, and twenty-four of them are 23 feet long each. Both sides of the screens are valuable as exhibiting space; and allowing 10 feet square to each exhibitor, 1,513 exhibitors can be accommodated on the screens alone. The halls of the building will accommodate 532 exhibitors, giving them also 10 feet square each, with some T-shaped screens in addition, giving 270 square feet, a total of 19,080 square feet being thus appropriated.

"The screens stand 16 feet apart, and in some cases floor space can be gained for exhibits between them; and floor space will be had for the same use all along the middle avenue between the ends of the screens. The T-shaped termination of the screens towards the middle avenue is available for pictures, and will be about 2½ feet wide. These ends of the screens, being covered with pictures, will greatly improve the effect in viewing the middle avenue along its entire length, as in sharp perspective it has the appearance nearly of a continuous wall of pictures. The main purpose of it, however, is to stiffen and strengthen the screens.

"It will be seen from this that there will be an exhibition of photography here such as the world never saw, if there is more enterprise shown in filling the space allotted than there is in subscribing for the stock to build it. In this matter we must do our best, or our friends will beat us. Dr. Vogel says that there will be a very elegant and interesting collection sent from Germany. It left Berlin in February last, we believe. Dr. Hornig, editor of the *Photo. Archiv*, in Vienna, writes that a fine collection is coming from his city. He says: 'I hope to be able, according to the invitation of our American co-workers, to excite an animated participation of our photographers, and I shall be glad if I can succeed, to enable me to show you my esteem for the extraordinary exertions you have made in the interest of our art.'

"M. Adolphe Braun, the renowned carbon art printer and publisher, has applied for 265 square feet of space, and promises to make a famous exhibit. Many French, English, and other foreign exhibitors, it is added, will join in the display."

The exhibition was opened on the 10th instant, but no details have yet reached this country of the detailed contributions. We fear that the photographic contributions from England will not fully represent the real state of the art here. Our German friends seem to have taken up the matter more enthusiastically.

FRENCH CORRESPONDENCE.

Permanency of Carbon Prints—Effects of Damp upon Pigment Pictures and upon Gelatine—Abel Poitevin's Dry Plate Investigation—Rossignol on Emulsions.

A good deal has been said lately, especially in England, about the permanency of carbon prints, and the very important question has been raised whether under some circumstances the pictures which we have supposed inalterable do not deteriorate in the same way as photographs printed by means of silver salts. I think, therefore, that the readers of the Photographic News will not be otherwise than interested in some observations upon the subject which I owe to my friend, M. Fleury Hermagis.

This skilful optician, who, as many are aware, has been occupying himself with the study of the production of photographs in fatty ink and in carbon, possesses a large number of prints in pigments. His collection is placed in a house in the country which he has at Nogent-sur-Marne, in the environs of Paris. Like all other properties in the vicinity of the river, his land has been under water during the extraordinary rise in the Seine and its tributaries since last March; and although it is now some weeks since the waters have receded, they have left in the dwellings a great deal of damp. Under these exceptional circumstances, it is true, M. Hermagis found that the greater part of the prints forming the collection of which we spoke underwent considerable change. They were covered with a kind of mildew, which gradually destroyed the whole picture. Notwithstanding the measures taken, in the preparation of the tissue, to modify the constitution of the gelatine, the latter, says M. Fleury, still remains an organic compound upon which exterior influences can work, especially when there enters the least trace of phosphate of lime into the question. And this compound is not unfrequently found in gelatine, since the majority of that purchased in commerce is the product of bones purchased from the slaughter-houses. A skilful chemist, M. Collas, has proved that the finest trace of phosphate of lime in a solution of gelatine is sufficient for the growth of organisms. He exposed to the air, in a damp atmosphere, some solutions of gelatine in the form of jelly, and after four-and-twenty hours there was a growth of mildew observable.

These facts suggest an idea which may, or may not, be feasible—viz., the introduction of borax into the mixture employed for the production of the tissue. It is well known that this compound is a powerful antiseptic, and, no doubt, if reduced to a very fine powder, it could be added to the colouring matter without difficulty.

In another way, it seems, moisture exercises a singular action upon gelatine; and this is what Dr. Van Monckhoven has to say upon the subject in his "Traité Pratique de Photographie au Charbon":—

"The gelatine must be preserved in a very dry room. If it is acted upon by damp, it undergoes two curious modifications. In the first place, it gives with the same quantity of water a liquid much thinner than before; and, secondly, it furnishes films soluble in water of a lower temperature. Gelatine of the best quality, if carelessly stored, is transformed into an inferior material."

M. Van Monckhoven also calls attention to the fatty matter which most gelatine contains, and which he gets rid of by dialysis or by means of soda; otherwise the gelatine will not yield an uniform film. This, indeed, forms one of the main difficulties in the preparation of pigment tissue.

An experimenter to whom I already owe more than one interesting communication, M. Abel Poitevin (of Louviers), has written me that a terrible disease has compelled him to relinquish, for the past eight months, the whole of his investigations in connection with dry plate photography, upon which he has been engaged for some time past. In conducting his experiments he had worked scrupulously under the same conditions, employing for each class of plates which he prepared the same silver bath, the same washing water, the same developer, and the same apparatus, operating at a like temperature and with the same light on all occasions.

M. A. Poitevin had found that as regards rapidity, bromized collodion held the first place, and the modified Taupenot the second; then came M. Constant-Delessert's process (albumeno-gallic), the ordinary tannin method, and, finally, resin collodion, with preservation. He tested his process from four different points:—1st, as regards the ease of preparation; 2nd, constancy and uniformity of results; 3rd, softness, purity, and harmony of the negatives; and 4th, the keeping quality or duration of sensitiveness of the films produced. Repeated experiments had permitted him to tabulate the order of the different processes in regard to these particular qualities:—

A.—*Facility of Preparation.*

1. The tannin process.
2. The albumen-gallic process.
3. The resin-collodion process.
4. The Taupenot process.
5. The bromised collodion process.

B.—*Constancy and Uniformity; and* C, *Softness, Purity, and Harmony of the Negatives.*

1. The Taupenot process.
2. The resin collodion process.
3. The albumen-gallic process.
4. The tannin process.
5. The bromised collodion process.

D.—*Duration of Sensitiveness.*

1. The tannin process.
2. { The albumen-gallic process.
   { The resin collodion process.
3. { The bromised collodion process.
   { The Taupenot process.

M. Poitevin proposes to make a more exhaustive trial yet before publishing his conclusions, and desires to have them controlled. He thinks, very justly, that a ventilation of the affair may be useful, but ill-health has unfortunately caused him to relinquish his self-imposed task. He has almost succeeded, he assures me, in producing sensitive pellicles of dry collodion, suitable for replacing dry plates. This method would obviate the rising and splitting of films, which happen with the films upon glass, especially in the Taupenot process. Let us hope that a speedy return to health may allow M. Poitevin to resume his study of this subject.

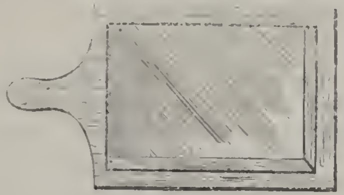
M. Rossignol has addressed a note to me upon the causes of non-success in the preparation of emulsions, in which he states that from a long experience of these preparations he believes they may be employed, both in the wet and dry process, as well with iron development as with the alkaline solution. He ascribes most failures to the impurity and want of uniformity of the chemicals employed, and that if more care were taken in the preparation of the pyroxiline, and in the rectification of the alcohol and ether, which frequently contain foreign bodies, more sure and uniform results would be secured. It is necessary, says M. Rossignol, to take account of all these variations in the preparation of emulsions, if one desires to obtain uniformity and certainty in the process.

Ernest Lacan.

A CHEAP AND EFFICIENT PLATE-HOLDER.

BY L. MACDONA.

Although a great variety of plate-holders have, from time to time, been contrived, the following, from its simplicity and cheapness, may prove useful to your readers. A piece of half-inch pine is cut of same shape, but a half-inch larger all round than the size of plate used; one end of which may be fashioned into a handle, as in the figure. Now get a carpenter to cut a "rabbet" a quarter-inch deep, and one-sixteenth inch larger than the plate you wish it to hold; fix in this rabbet a glass plate, by means of marine glue or putty; give the holder a coat of shellac or paraffine, and you have a plate-holder possessing, amongst others, the following advantages:—It allows the negative to be held up to the light without any fear of its falling off, adhering as it does to the glass by capillary attraction; the free silver, instead of being washed off by the developer, is retained on the plate and assists in increasing the density; less developer is used, and useless waste avoided; and last, but by no means least, the fingers escape the slightest stain. The figure will explain all.



TO GLAZE PHOTOGRAPHS WITH GELATINE.

Sir Thomas Parkyns sends us the following formula, which he saw successfully practised in Italy:—

Take of gelatine, eight parts (French measures); water, fifty parts (about). Add two or three drops of glacial acetic acid, to render it more clear, and dissolve by heat. To use the gelatine:—1st. Coat a very clean and flat glass plate, somewhat larger than the photograph to be glazed, with normal collodion (uniodized). Let it dry thoroughly. Have ready a Berlin capsule filled with water. Heat the same to a moderate (milk) temperature. Take of the warm water and flood your collodionized plate, which should have been warmed over the capsule; then, having drained, flood with the solution of gelatine through a filter of cotton-wool in a tin dish. This will drive off the water. Rock the plate. Warm the photograph (which has been mounted on cardboard) over the warm water; place it carefully, but lightly, on the gelatine coat, face down on the glass, and—taking care that there shall be no air-bubbles—by commencing at one side, press it with another very flat piece of glass, so that it may closely adhere. Then add a heavy weight, or pass it through a press. Stand up to dry, which should be for at least twenty-four hours (less than twenty hours is quite useless). When dry, cut round the mount through the collodion with a sharp knife, and proceed to raise the print from the collodionized glass. This finishes the operation, and the print will be completely glazed.

ON THE ENLARGEMENT OF SMALL NEGATIVES BY THE AID OF PETROLEUM OR GAS LIGHT.

BY DR. LIESEGANG.*

In the year 1872 I described a method of enlarging by means of the carbon process. I then remarked that in the production of large pictures from small negatives the carbon process had many advantages; in the first place, the result was a permanent one, which is a matter of consideration, seeing that a high price is paid for it; next, the dispositive could by no other method be produced so good and so easily; and, finally, the result was more beautiful than that secured by any other process. Moreover, it may be said that any passable negative may be employed in the process; it does not need to be taken upon patent plate, and requires only to be sharp to give a good enlargement.

A transparency upon glass is obtained from the negative by simply putting the exposed and moistened tissue upon a well polished glass plate, and developing with warm water. From this diapositive an enlarged collodion negative is produced in the copying camera, which is printed by means of the carbon process.

As to the application of a petroleum light in this enlarging process, I called attention to it in 1874, and in July of the same year I published a detailed account of the Lambertype process, which is no other than a repetition of my method. Like many other really good processes, this remained perfectly unheeded until general attention was attracted by loud heralding in Paris, and by the magnificent enlargements which reached Germany. The experience gained in the course of the winter of the use of artificial light, and the circumstance that the process was successfully practised in many establishments, and was protected by patents both in England and France, led me to give once more the details of the process, although I cannot guarantee that my neighbours in Paris actually followed the directions given by me in every particular. I consider it due to myself to make these preliminary remarks, so as to anticipate reclamations which are often forthcoming when my articles make the round of the foreign press.

The Carbon Transparency.—The transparency necessary for copying purposes must be of a totally different character to such pictures as are employed for window ornaments, lamp shades, and other similar purposes. Instead of securing a vigorous and plastic transparency of an agreeable nature with opaque pigment in the deepest shadows, it is necessary to secure a thin and delicate part. Such a picture is not to be secured with the black image, which permits the light to come through in every pigment tissue employed for the preparation of stereoscopic transparencies, which contains a large amount of colouring matter, but it requires a tissue having little bone black in its composition, but a finely divided pigment consisting of a good deal of carmine and Venetian red.

The preparation of the tissue in the bichromate bath is undertaken in the same way as in the ordinary carbon process; as it comes out of the bath it is laid face downwards upon a well-cleaned patent plate, covered with a sheet of waterproof cloth, and manipulated with the squeegee. It is permitted to remain for five minutes upon the glass plate, and is then detached and hung up to dry. It is put into a printing frame with a safety edge of white paper, and should receive half as much again exposure as in ordinary carbon printing. The exposed tissue is moistened in cold water as usual, and placed upon a cleaned and perfectly faultless plate, to which it is made to adhere by means of the squeegee. The glass plate in this case is not rubbed with wax, but it may be coated with a very thin structureless normal collodion, and put into water until the grease has been removed from the surface. The moist carbon tissue is then applied and developed in the usual manner.

It has been found that the most certain results are obtained by coating the glass plate with collodion instead of gelatine. When this is the case there is no reticulation of the tissue, a defect which is due partly to the temperature at which the tissue has been prepared, as also to the employment of gelatine of different qualities. As it is of the utmost importance that there should be no defects in the film, seeing that these are afterwards enlarged, it is certainly well to use gelatine upon the glass. A thin gelatine solution is employed, which is mixed with chrome alum and dried before being put in cold water to receive the tissue.

To secure impressions of great delicacy and sharpness Monckhoven proceeds in a different manner. He imparts to the tissue a fine mirror-like surface. A piece of patent plate, carefully cleaned, and somewhat larger than the sensitized tissue, is covered with very clear normal collodion, and allowed to dry for a few hours in a place free from dust. The plate is neither washed nor dipped in water.

The tissue is put into the bichromate bath, face downwards on the collodion film, and then pressed down by the rubber-cloth and squeegee. The tissue is then allowed to dry upon the plate. In this way the tissue will keep good for a week, several such plates being prepared, and laid one upon the other, so that the back is protected from the air. Care must be taken to avoid air-bubbles, for as soon as the tissue lies closely to the film, it cannot be lifted without tearing the collodion.

The drying takes from three to four hours at a moderate temperature.

Before use, enough of the tissue for use is cut off, and the rest left upon the glass. The tissue has a mirror-like surface, and as it can be placed quite flat against the glass, it must of necessity yield better and sharper impressions than rough-surfaced tissue which has been dried in the air. It is exposed in the ordinary way, and before development it is put into water which has been rendered slightly acid by the addition of one-tenth per cent. of hydrochloric acid. The tissue must remain in here a little longer than usual, in order that the gelatine absorbs the water thoroughly, and that no net-work may be formed in the film. The tissue is applied to a piece of faultless patent plate without collodion or wax substratum, and pressed to the glass with the squeegee, but without using the rubber cloth. It is better to avoid air-bubbles altogether, rather than seek to get rid of them afterwards with the squeegee. If the tissue curls at the edges it is kept down by a plate placed above it; after half-an hour it will be quite flat again. The development should not commence sooner than this.

The development is begun in the first place with lukewarm water (28° Reaumur), and afterwards water at a higher temperature is employed. If the collodion does not separate on washing, then you must either wait a few hours between the application of the tissue to the glass, or coat the plate previously with a thin solution of gutta-percha in chloroform. This coating must be quite dry, and then the picture attaches itself very well.

The transparency requires after washing to be intensified at times, an operation that cannot, unfortunately, be undertaken with a gelatine substratum, as this becomes darkened also. Where collodion has been used upon the glass, or there is no substratum at all, then the undermentioned solutions may be employed with success:—

a.—	Permanganate of potash ...	2 grammes
	Water	500 ,,
b.—	Sugar	1 gramme
	Ammonia	1 ,,
	Water	500 grammes

Equal parts of *a* and *b* are put into a developing dish, and the negative laid therein. The result will be that the gelatine film rapidly assumes a yellowish colour. Care must be taken that the intensifying of the image in this way is not driven too far.

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* *Photographisches Archiv.*

This particular mode of intensifying has the advantage over other otherwise very perfect processes in the circumstance that it is only the tint of the image that is altered, and there is no formation of any granular deposit, as in the case of other means that are adopted.

In a dry state, the image placed against white paper must appear darker than an ordinary carbon print.

The retouching of these transparencies is carried out by strengthening the shadows by means of a stump of paper or leather and the finest powered graphite, which adheres very well without admixture of glycerine; the spotting out and sharpening are performed with the brush and Indian ink. The carbon image may also be worked upon by the ordinary pencil, only one must take care not to damage the film.

Correspondence.

THE REJLANDER MEMORIAL FUND.

Sir,—Will you permit me to inform those who were so good as to subscribe to the Rejlander Memorial Fund that a meeting of the Executive Committee was held on the 18th inst., Sir Coutts Lindsay in the chair, for the purpose of winding up affairs. It was then announced that the monies received from all sources amounted to £270, and that all the creditors of the late Mr. Rejlander had been satisfied. £122 has been paid on account of debts, and £20 advanced to the widow, leaving a balance in hand of £128, which may be slightly increased by a few donations.

It was resolved that this balance should be handed over to a committee of four gentlemen, to be employed to the best advantage of Mrs. Rejlander; their names being Sir Coutts Lindsay, Mr. Valentine Blanchard, Mr. W. F. Mills, and your obedient servant, H. Baden Pritchard.

War Department, Woolwich, May 19th.

FADING OF SILVER PRINTS.

Dear Sir,—Almost all who have written upon the subject of the fading of silver prints have referred to the dangers existing in the various stages of toning and fixing; one or two have just glanced at the dangers which lurk in mountants and mounting boards, but I have unhappily had an experience lately which has roused me from dreams of security, and entirely upset my faith in silver prints. I do not wish to be misunderstood: I am quite convinced that silver prints, properly fixed and washed, are as permanent as need be, for I have unmounted prints in my possession which are as good now as they were when first done many years ago; but now that my attention has been directed to the subject, I find that all my unmounted prints are untouched by time or exposure, while those which have been mounted are all more or less affected.

I have been for some time engaged in the production of silver prints from large negatives for finishing by the Vander Weyde process, and knowing that all my prints are carefully treated all through their various stages, I have felt secure in the stability of the prints turned out till some three weeks back, when I had a trouble I have never before experienced, and which I have at last traced to the mounting board. I have for a long time been getting the same quality of sheet board from the same house, and yet this trouble has only just made its appearance. After the prints are mounted they are covered with a multitude of white spots, which spread till the whole of the picture is eaten away. I tested the boards for hypo, but could not find it, and could not think it could be the boards till one day a print which was mounted upon a board too small for it gave me the key to the mystery. The part which overlapped, and did not touch the mounting board, was as good as could be, without a speck, but everywhere else the spots were as thick as possible. Prints done at the same time and still unmounted are as good as when at first done, but those that were mounted are all useless. I have tried the effect of various things which I thought might be in the board, but chloride of lime is the only substance which produces the same effect upon the print. Here, then, is a danger we cannot guard against, nor can we tell how long this effect may be caused by some substance in the boards we use; it may be, as in this case, full of the injurious compound, and so show itself at once, or it may be in smaller quantities, and so take longer to do its work; but this uncertainty will make me banish silver at once. The pictures composed of the salts of silver may be, and are, permanent when finished carefully and left unmounted, but it is such a delicate compound, and is so liable to be damaged by so many of the compounds which enter into the composition of both mountants and mounting boards, that the only safety is in abandoning its use altogether. Carbon prints may lose their colour (they can never fade), but a print in pure carbon is preferable to the uncertainty of silver prints. I send you two of the prints with their overlapping edges, and you will be able to see that the spottiness is entirely due to the mounting board.—Yours truly,

G. Croughton.

Proceedings of Societies.

Manchester Photographic Society.

The last meeting before the holidays was held at the Memorial Hall on Thursday evening, the 11th inst., Mr. A. Brothers, F.R.A.S., V.P., in the chair. After the routine business, the Chairman read the following resolutions of the council:—"That a special out-door meeting be held to commemorate the twenty-first year of the Society's existence, and that the trip be to Alderley." "That the members assemble at the Queen's Hotel, Alderley, at six o'clock, for tea." "That the secretary shall fix the day."

The Chairman then read the following letter from Mr. W. D. Sanderson:—

"Manchester, May 8, 1876.

"My Dear Sir,—I fully intended being at the meeting of the society on Thursday next to make a communication to the members of the society respecting a new method of preparing collodio-albumen plates, so much used, and with such great success, by the majority of our numerous society; but, having to leave home on Wednesday, I shall be prevented. However, I think the next best thing to do is to send the information I have to impart to you, especially as this is the last meeting before the vacation. The only objection, I think, that can be raised against the collodio-albumen process is the long preparation of the plates, and with a view to reduce this, three years ago I first prepared a few plates without a collodion bath. First of all I covered the plates with one part albumen, water 30; when dry, pour on a bromo-iodide emulsion, allowing it to set; then immerse it in a dish of water, and wash well afterwards, proceeding in the usual way of preparing collodio-albumen plates, so well known to the members of this society. The baking before a fire or in an oven I entirely omit, for the simple reason that I find there is no difference in plates so treated and those dried spontaneously. The emulsion I made by adding to one ounce of collodion (Huggon's) eight grains of nitrate of silver, first dissolved in a little alcohol; when ready, add by degrees to the collodion, shaking well after each addition; allow it to rest a day or two, and again shake well, and filter through cotton-wool. The negatives I have sent were prepared in this way, and I leave you to judge whether the matter is worth communicating to the members.—I remain yours sincerely,

W. D. Sanderson.

Mr. Brothers described and exhibited the simple but efficient appliances used by himself in taking photographs of the moon.

Mr. Coote showed some negatives on plates prepared with the Liverpool emulsion. Although the plates had been kept five months, the negatives on them were perfectly clean and good. The exposure given was two and a-half to three minutes.

Mr. Noton exhibited some new machinery for producing oxygen, and read a paper on the subject.

Mr. D. Young showed a large retort and gas jet capable of supplying sufficient oxygen for ten limes in work at one time.

Mr. Lever claimed to have made a similar article fifteen years since.

Mr. Leigh showed a collodion filter in which fine sand, supported by a bit of muslin, was used to filter through.

Mr. Chapman sent one of Kennett's new camera stands for exhibition.

Mr. McLeod, of Newark, presented four fine views of Lichfield Cathedral for the society's portfolio.

The thanks of the meeting were accorded to all the gentlemen who had contributed to the evening's entertainment, and the meeting adjourned. C. Adin, Hon. Sec.

Talk in the Studio.

Tint Negatives.—We have received from Mr. D. H. Cussons, of Southport, some examples of tint-negatives with marble, diaper, and other patterns for the margins of card and cabinet portraits, where the image is printed in medallion. They are on a stout pellicle instead of glass, and are admirably suited to their purpose. They will prove very useful to many portraitists.

Mr. Worsnop's Tent.—Mr. Worsnop writes as follows in reply to queries:—"The bottles containing the chemicals are packed in pockets made of leather, which are tacked to the side of the box (window side); on the same side, to the right of the window, is nailed a short piece of leather, about an inch long, with a buckle attached to it, and about eight inches opposite a strap is nailed. With this and the buckle the bath-holder is firmly strapped to the side of the box when not in use; but when working, the strap is lengthened, and the bath-holder placed in a slanting position, the top resting against the strap, and the bottom against the side of the box. The cover is simply wrapped neatly together, so as to occupy as little space as possible, and packed in the box; and, lastly, the tent is attached to the tripod stand in the following manner:—Half a dozen stair-rod eyes (those with the straight screws) are screwed into the edges of the box—viz., two in the centre at the back, and two on each side at the front; they are placed about two and a-half inches apart. I hope this explanation will make the thing clear."

Hard Paper.—French manufacturers have a method of rendering paper extremely hard and tenacious by subjecting the pulp to the action of chloride of zinc. After it has been treated with the chloride, it is submitted to a strong pressure, thereafter becoming as hard as wood and as tough as leather. The hardness varies according to the strength of the metallic solution. The material thus produced can be easily coloured. It may be employed in covering floors with advantage, and may be made to replace leather in the manufacture of coarse shoes; it is also a good material for whip handles, the mounting of saws, buttons, combs, &c. A great deal is used in large sheets for roofing. Paper already manufactured acquires the same consistence when plunged, unsized, in a solution of the chloride.—*Scientific American.*

To Correspondents.

J. T.—The chief fault of the ferrotype which you enclose is considerable over-exposure. It is apparently produced with a comparatively new collodion, over-exposed, and developed with a freshly mixed solution of iron somewhat too strong. Use a riper sample of collodion, or, if you cannot procure that, add a few drops of tincture of iodine to that you have until it acquires a deep sherry colour. Also use your developer weaker. Instead of ten ounces of water, use fourteen, and add ten drops of nitric acid as well as the acetic acid. Fog may proceed from a variety of causes, which you will find enumerated in various articles on the subject in our back volumes, and succinctly in most of our Year-Books, where also remedies are stated. One of the best and simplest remedies consists in first neutralizing by the addition of a few drops of a ten-grain solution of carbonate of soda, then exposing for a few days in a flat dish to sunlight, filtering, and then adding a few drops of nitric acid.

W. H. B.—The weakness and flatness of the prints you enclose may proceed from a variety of causes. They might be the result of weak negatives, poor paper, or weak nitrate bath. But it is very likely that the defect proceeds from another cause, namely, the use of the paper for printing in an absolutely desiccated condition. Sensitive paper should be used in what is usually considered a dry state; but if it is absolutely "bone dry" it will often yield poor, flat, tame prints of the character of those you enclose.

An Amateur.—You will see on reflection that we cannot with propriety undertake the invidious task of recommending especial lenses in this column; besides, your description of what you require is somewhat vague: "heads of two inches and upwards" is a term which includes a large range. A portrait lens stopped down will do the work; or, if you are content with slower work, one of the class advertised as D lenses, especially for such work, will answer.

F. M. Y.—There are various modes of reducing the intensity of an over-intensified negative, but all of them, in our experience, attended with some risk of injury to the more delicate tones. The use of a weak solution of perchloride of iron is said to be the safest. We prefer, with an intense negative, to modify the printing condition. The use, for instance, of washed sensitive paper, and printing in sunlight, will often give soft prints from a hard negative. 2. The object of heating a dry plate is to get rid of the imperceptible moisture. A plate may seem to be dry when it really is not so.

Highbury.—The defect known as flare consists in a spot in the centre of the plate much lighter than the rest of the picture. In the print sent there is a darker spot or patch not in the centre of the plate. It probably proceeds from having poured the developer in a stream on one part of the plate, so washing away the free silver solution from that part, and making a thinner patch in the negative. The developer should be spread gently in an even wave all over the plate, so as not to wash the silver solution from the part where the developer falls on the plate.

W. C. (West Hartlepool).—You have undertaken a series of chemical operations without, we fear, having much knowledge of the reactions to be secured, and the best purpose to which you can put the solution with which you have been experimenting is to add it to the wastes for converting into silver. In the first place, it is unwise to neutralize a negative bath with ammonia, as the nitrate of ammonia formed, being a solvent of oxide of silver, is a frequent source of fog. In the next place, in neutralizing with carbonate of soda, do not add the soda salt to the bath, as that produces violent effervescence, which will continue as long as you continue to make the addition. A person unfamiliar with the operations fancies acid is present as long as the effervescence goes on, and so continues until the whole of the silver is precipitated as the carbonate. Make a ten-grain solution of the carbonate, and add a few drops, shaking the silver solution, and then allowing it to stand a few minutes between each addition. When there is a permanent cloudiness, which does not disappear after the solution has stood a few minutes, the solution is quite neutralized. Acetic acid should not be added to a negative bath, as it produces a very unstable bath. The effect produced on burning the filtering paper was due to nitrates of ammonia and soda. You had better begin again with a new bath.

E. H.—The size of camera much depends on the purpose and taste of the photographer. For most landscape purposes a camera of seven and a-half by five inches is very convenient, easy to carry, and yielding pictures of a pleasant size. 2. We cannot recommend makers of apparatus in this column with any fairness. We must refer you to our advertisement pages. 3. Success, in most of the dry processes, depends on having mastered them fully. Every one has its advocate, who thinks it simpler, more certain, or more excellent than all others. The coffee process is very simple, and yields good results; so does Captain Abney's albumen and beer process.

X. X. Z.—Marine glue, in our experience, is quite inert, so far as nitrate of silver is concerned. We have used it both to aid in making and repairing baths without any ill effect whatever.

D. Lion.—The red colour of the deposit is not an objection in negatives. It is very common in plates by some processes. A trifle shorter exposure will reduce the tendency to redness. It is impossible to give any idea of exposure: condition of light, character of scene, distances of objects, and various other incidents so materially modify the matter. The appearance of the image on the ground glass, to an experienced eye, is the best guide; and to the inexperienced a trial is the only efficient guide.

G. Brooker.—In making matt varnish by using a mixture of ether and benzole as solvents to the resin, a little experimenting is always necessary, as it is impossible, without trial with the immediate samples in hand, to determine the proportions. In the formula in question, from one to four ounces of benzole might be required to ten ounces of ether. Add one ounce, and try, and keep adding and trying until you get a matt surface, using waste negatives for trial, as the varnish is apt to dissolve the film if it have very little benzole.

L. Macdona.—Many thanks.

R. F. D.—Full particulars of the exhibition of the Photographic Society will be duly announced. It will open in September, in the Water Colour Gallery.

A Young Beginner.—The inside of cameras is generally blackened with lamp black and strong size. The black work of lenses is blackened by means of a solution of bichloride of platinum to which a few drops of nitrate of silver solution are added. The stops should be so blackened.

T. Beringer.—In adopting Bigelow's lighting, you cannot do better, we think, than carry out his plan in detail. Any modification which may be desirable should arise out of practice rather than conjecture. We have not practically worked out his method.

C. J. Farlie.—In our next.

Several Correspondents in our next.

The Photographic News, June 2, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The "Challenger" and the "Pandora"—Photography at the Philadelphia Exhibition—Solar Photography in France.

The "Challenger" and the "Pandora."—Last week saw the *arrival* of the *Challenger*, and the *departure* of the *Pandora* to the Arctic seas. The *Challenger*, as our readers may remember, was despatched more than three years ago, in December, 1872, to make a tour round the world for the purpose of surveying and exploring the ocean's depths in different parts of the globe. The expedition was sent out at the earnest solicitation of the Royal Society, Dr. Carpenter, perhaps, more than any one else, being instrumental in urging the importance of such an expedition on the attention of Government. A scientific staff, with Professor Wyville Thomson, F.R.S., of Edinburgh, at the head, was engaged, and these gentlemen discharged between them the duties of chemist, mineralogist, and naturalist. Captain Nares, R.N., was at first chosen to command the *Challenger*, by reason of his experience in the matter of surveying and deep sea dredging; but when the voyage was but half over, he was summoned back from China, to assume the command of the Arctic expedition, which sailed last year in the *Alert* and the *Discovery*. The *Challenger* continued on her mission, in charge of Captain Frank Thompson, R.N., and has now returned to England, with the loss, however, of one of the scientific staff, Herr Von Suhm, who died at sea, near the Sandwich Islands. As many as 710 deep sea dredgings or trawlings were accomplished, and specimens were in this way taken from a depth of nearly 5,000 fathoms, or about six miles. As might be imagined, the obtaining of specimens from the ocean bed at this extreme distance was a matter of considerable difficulty, and sometimes days were devoted to the accomplishment of a perfect dredging operation. Temperature observations of the sea at these great depths were also secured by the staff, who have, indeed, collected an amount of information which will serve for interesting discussions among the members of learned bodies for some time to come. Professor Thomson forwarded to the Royal Society from time to time an account of the observations made, so that he has little left to tell in regard to scientific results; but he brings home with him a vast and most complete collection of objects from that weird kingdom under the sea, comprising representatives of the animal, vegetable, and mineral world. Fishes and animalculæ from various depths have been captured and preserved by the naturalists, which will convey a most perfect idea of submarine life; while the chemist on board has busied himself with the examination of waters taken from different parts of the globe and at different depths. The bottom of the ocean, when very deep, almost invariably consisted of fine ooze, and the nature of this ooze proclaimed to the mineralogist of the party the character of the earth's crust at that spot. As may be guessed, the microscope was frequently brought into requisition, and brought to light the existence of minute shells and animals of whose existence there had previously been no evidence. The *Challenger* is said to have sailed upwards of 80,000 miles during her protracted voyage, which was accomplished without any serious or untoward event, if we except three deaths that occurred on board. The *Pandora*, which has started on her second Arctic voyage under Captain Allen Young, goes out with the hope of bringing back news of the Arctic expedition under Captain Nares, as also for the purpose of attempting a North-West passage home. Captain Young's crew is necessarily a limited one, for the vessel is not large, and, moreover, food and coal sufficient to last two years had been taken. But, notwithstanding her limited accommodation, Captain Young has found room for a photographer on board, who is to bring back pictorial records of the trips, and who will, doubtless, if the crew of either the *Alert* or *Discovery* are met with, also afford convincing proof, by the aid of the camera, of the well-being or otherwise of the members of the expedition. The photographer in question is Mr. W. J. A. Grant, of Merton College, Oxford, a frequent correspondent of the News, whose name as a dry and wet plate worker is already established. "A Cornfield," and "Bits of Devonshire," will, no doubt, be fresh in the memories of many of our readers who remember the exhibitions of three or four years ago, for the pictures were quite of the Gordon school, and had all the charming softness, together with fineness of detail, which characterised the bijou work of that well known amateur. If any one is capable of doing the work on such an expedition, it is certainly Mr. Grant, and we congratulate Captain Allen Young on the selection of such an efficient and experienced worker with the camera.

Photography at the Philadelphia Exhibition.—Dr. Hermann Vogel, of Berlin, proceeds to Philadelphia as representative and juror of photography for Germany and Austria, and will be absent, probably, for three months from the Prussian capital. There will be, however, but little for him to do, we fear, for European photographers are, from all accounts, very inadequately represented at the International Exhibition. The great distance and the difficulties placed in the way of forwarding objects to the United States have deterred many from contributing, while some of those who have sent, have been so troubled and worried over the forms and regulations to be complied with, that they will hardly be induced to take part in any similar affair in future. There are so many German photographers settled in New York, that Dr. Vogel is sure of a welcome, especially as he is President of the Berlin Society, which has a branch in the United States, whose members correspond and discuss in the German language.

Solar Photography in France.—M. Janssen, the well-known French astronomer, has been publishing some account of his solar photographs, which are taken daily at his Observatory in Paris. It is anticipated that the French Government will shortly sanction the building of a public observatory for his special use, where photo-astronomical observations will be more particularly considered. It appears that lately there have been no spots visible on the sun, a most unusual state of things, for as late as February last the disk showed a large number. Gradually the spots disappeared from rotation, and by the 13th of March there were were only two groups to be seen. In five days more, but two solitary spots remained, and these latter disappeared on the 25th of the same month. It is a most interesting study to examine a series of these solar photographs taken day after day. You observe how the spots begin to make their appearance at one margin of the sun, how they gradually move towards the middle of the disk, and how they gradually disappear again at the opposite margin. These spots, too, are found to repeat themselves year after year. According to M. Janssen, not a single spot was seen upon the sun from the 25th March to the 20th May, the bright disk during the whole of this period appearing perfectly uniform and unbroken. M. Janssen's daily pictures of the sun measure twenty centimetres in diameter, and they are taken by means of the instrument he invented for the transit of Venus observations, the *Revolver Photographique*, which has been several times mentioned in these columns. It is high time we had a careful photo-astronomer in Europe, for till now Mr. Rutherford, of New York, has fairly eclipsed all workers in this interesting branch of science.

BICHROMATE AS A POISON.

BY DR. B. W. RICHARDSON, F.R.S.

[In the course of his lectures on "Unhealthy Trades," Dr. Richardson gave the following copious details of the physiological action of bichromates.]

In the latter part of last century—viz, in 1797—the distinguished chemist Vauquelin, discovered the mineral substance to which he gave the name of "chrome," from the Greek *chroma*, colour. The salts of the metal have the property of communicating colours of a beautiful kind to many varied substances. For the market it is produced in large quantities in the form of bichromate of potassa, the red crystalline salt with which, I dare say, you are all familiar.

Various manufactories of bichromate of potassa exist in different parts of the world—in England, France, America, and Germany. The manufacture is important to our present studies from the circumstance that a peculiar form of disease arises during the process. The first observer who took a note on the disease in question was a French physician, Dr. Bécourt. By an accident, Bécourt met with a man who was engaged in a manufactory of bichromate of potassa, and who was suffering from a peculiar kind of ulceration in the face. The case was studied by Bécourt, in consultation with the distinguished hygienist, Chevalier, and they both came to the conclusion that the manufacture of the bichromate was probably the cause of the disease. They failed to obtain from the man, however, any such particulars as they could consider satisfactory; they therefore looked in other directions for more knowledge. After a time they obtained from the director of a manufactory at Graville the information that many of the workers in the manufactory were subject to a peculiar form of disease.

In transforming a neutral chromate of potassa, by means of the acid, into bichromate, the vapour arising carries with it an infinity of pulverised molecules of the product which spread through the workshop. A cloud of particles is easily visible in a ray of sunlight. The particles inspired abundantly, give to the palate a bitter and disagreeable taste; but as saliva is profusely produced, the chromate is thrown off, and has not time to inflict injury.

If, instead of breathing by the mouth, which for long periods of time seems impossible, the particles are drawn in by the the nose, great irritation of the delicate membrane lining the nose is produced; there is a violent sensation of pricking, suffusion of tears, and irresistible sneezing. There follows upon this ulceration of the septum of the nose—the partition that divides the two nostrils—and ultimately the septum is destroyed altogether and lost. Upon this the symptoms cease, and the workmen, as a rule, continue steadily at their employment without further suffering. Chevalier and Bécourt are of opinion that this process of ulceration of the nose is not produced in those men who take snuff.

From the inquiries I have made respecting the manufacture of the bichromate in this country, I learn that this peculiar ulceration is of very rare occurrence, and of late years, owing to improvement in manufacture, has not been observed at all. The accidents that are met with are certain ones which arise from contact of the bichromate with wounds of the skin.

The two French physicians, to whom I have already referred, noticed the same fact. They determined that if the skin of the body be entire, it may be exposed to a strong and even to a heated solution of the bichromate, or that it may remain for many hours in contact with the salt itself without any bad effect. But if the skin be torn, or abraded, or cut, and the salt be left in contact with the wound, the caustic action is so intense that severe inflammation follows, with decomposition of the living tissue. The caustic action is so great that it does not cease until it has penetrated to a bone. The pain of the ulceration is excessively severe. It has also been observed that when a large surface of the skin is exposed to this irritation, a peculiar irritability of the skin, and a violent itching is set up. This is unattended by ulceration if the skin be not abraded by rubbing; then a troublesome and very painful ulceration occurs.

M. Clouet, a manufacturer of bichromate of potassa, at Havre, has added to the above facts others, which are of importance in their bearing on this subject. He shows that the inferior animals suffer from the effects of the bichromate as severely as man. Horses employed in the manufactory, and which walk over the bichromate salt, are attacked in the feet; the hoof falls off, and the ulceration extends to the upper part of the leg. In one instance of this kind, recorded by Chevalier and Bécourt, a horse was attacked in one of its hind feet, and was quite disabled. The master of the animal, not suspecting the cause, knew nothing of the treatment, so merely sent the horse to rest. The ulceration extended through the limbs, and through nearly half the body of the animal, and death occurred within a month of the commencement of the malady. Both legs on the affected side were entirely ulcerated. It was as though when the decomposition had commenced it went on indefinitely as a veritable metamorphosis of the skin and flesh together, analogous to a fermentative action. Dogs, and cats, and rats were discovered in the manufactory suffering in a similar manner.

Bichromate of potassa, taken internally by the mouth, is a purgative, and in large doses of from fifteen to twenty grains is poisonous. It causes severe colic and purging, but no vomiting. M. Clouet, to whom we are so much indebted for information on this subject, and who first made observations respecting the internal action of the bichromate, states that in one manufactory some workmen inflicted the foolish and practical joke of putting some bichromate of potassa into a barrel of cider, from which other fellow-workmen drank. The cider was rendered of a dark colour; but, notwithstanding, the workmen drank of it, and were all affected with severe colic and diarrhœa.

MICRO-PHOTOGRAPHS OF MAPS.*

The proverb that "necessity is the mother of invention" was illustrated in many ways during the siege of Paris, and particularly in respect to corresponding with the outer world. This, as our readers know very well, was done by the aid of balloons, and also by having recourse to the camera to diminish written documents to the smallest dimensions, subsequently to enlarge them. Carrier pigeons acted as messengers to carry little film rolls, upon which were crowded together more news and correspondence than is contained in a newspaper of ordinary size. It was the custom during the time of the siege for French families outside the city to send in a micro-photographic copy of the London *Times*, so as to give their imprisoned friends in the capital the information concerning each other which was contained in the announcements of that paper. A whole page of this newspaper was photographed at a time in such small characters that the lines were quite illegible to the naked eye; and this microscopic film having been forwarded to Paris by means of a winged messenger, it was put into a so-called sun-microscope, enlarged, printed upon sensitive paper, and distributed.

M. Dagron, who worked out this system of sending microscopic despatches, and actually reduced as many as three thousand letters upon one little sheet half the size of a cigarette paper, has now turned his attention to the reduction of ordnance maps in the same way, and is at present engaged in producing all the maps of France to such dimensions that they can easily be put into a pocket-book. Indeed all the ordnance maps of Europe may be put into a cartouche box, together with the telemeter or enlarging apparatus necessary to examine them with.

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* *Photographisches Archiv.*

The invention of the Télémètre Micrographique is the work of MM. Dagron, Dallemagne, et Triboulet. The diminution of the maps may, of course, be undertaken all upon the same scale, and the less the reduction the more conveniently, of course, can they be again enlarged. M. Dagron reduces a French ordnance map from seventy-two centimetres high and thirty centimetres broad, to seven centimetres by five centimetres. The film, or glass plate, upon which it is located, is brought under a powerful microscope shaped something like a stereoscopic apparatus, and under this instrument the map appears enlarged to its original size. If the image upon the glass is pushed to and fro, any part of the map may be studied at will, as the eye catches one portion after another. Not only are the details of every place clearly seen by the observer, but he views at the same time the different curves or circles which have been made upon the map to show the distances of places from one or more centres. Any alterations that may become necessary may be put in by hand upon the original map, and then, of course, any number of copies that may be desired of the same are struck off by photography.

As the film upon glass is examined with the microscope as a transparency, far more detail is to be seen than if the image were opaque, and the clichés and impressions are so small and delicate that a burning match, nay, even the glow of a cigar, is sufficient to enable one to see the smallest spot of the map in an instant. It is as much, therefore, to the Télémètre Micrographique as to the production of the tiny maps that the important success of the system is to be attributed.

THE PREPARATION OF DRY PLATES.

BY PROFESSOR H. VOGEL.[*]

It is a singular fact that many photographers have a particular aversion to the adoption of a dry process. Even when the matter is put before them in the most favourable manner, they will hear nothing of it. They have no confidence in the process nor in themselves, and I have often been amused at the timidity shown by old photographers in my presence when they conduct the manipulations of some dry process or other. Most of them believe that a particular routine and special experience are necessary, as also that something of a secret character is wanted. If I make mention of alkaline development, then they at once assume there is something mysterious in the matter. Only very recently I had a couple of these anxious gentlemen in my studio, who would have nothing to do with dry plates, and into whom I managed to infuse courage in a singular manner. At the same time a young pupil entered my laboratory, who came quite ignorant upon photographic matters, but who turned out a very apt scholar; and in order to prove to the two gentlemen that the preparation of dry plates involved no mystery, I permitted this young fellow, after he had had a little practice in the collodionizing and sensitizing of plates, to prepare some dry plates forthwith, and, behold, they turned out excellently well.

Every well-prepared portrait plate produced by the aid of good chemicals may be transformed into a dry plate. You have nothing else to do, after it has been sensitized in the silver bath, but to wash it in a dish of distilled water, and as soon as the marks of grease have disappeared, to rinse it under a tap, the back and front being afterwards again washed with distilled water. Finally, there is poured over the film an aqueous filtered solution of tannin of two per cent. strength, a little of the fresh clear liquid being taken for every plate. This is all. To develop, you simply moisten the plate with alcohol, not too strong, wash it under the tap, and treat it with ordinary pyrogallic acid and silver solution, such as is employed for intensifying purposes.

I am far from recommending the use of dry plates for every purpose where wet plates are employed. There are, however, occasions when you have neither the desire nor opportunity of carrying with you the whole collection of apparatus necessary for dry plates, and when a moderate result will satisfy you, for in quality dry plates are much inferior to wet ones. All the big photographers of Venice take their architectural pictures upon dry plates.

As a matter of course, dry plates will not retain their sensitiveness for ever; their sensitiveness becomes less daily, and for this reason it is advisable to employ them before they are too old.

As simple as the above is the preparation of bromide of silver plates to be developed by means of an alkaline solution. You prepare for the purpose a strong silver bath, made up of—

Water	100 grammes
Nitrate of silver	12 ,,
Nitric acid	3 drops

Into this bath are immersed for a period of five minutes the plates which have been coated with collodion prepared according to this formula:—

Bromide of cadmium	2 grammes
Alcohol	30 ,,

A solution is made, and this is added to—

Normal collodion (2 per cent of pyroxiline)	90 grammes

After sensitizing, the plates are as carefully washed as before described. In this case, however, a film of tannin is not only unnecessary, but actually injurious to the plate.

These bromide of silver plates are only about a fourth as sensitive as wet plates, and require, therefore, to be exposed four times as long as an ordinary wet collodion film.

The alkaline development, all said and done, is a very simple affair. The exposed plate is moistened with alcohol as described above, then rinsed under a tap, and treated with the undermentioned solution, viz.:—

Alcoholic pyrogallic acid solution (10 per cent. strength)	½ cub. cent.
Ammonia	3 drops
Bromide of potassium solution (25 per cent. strength)	1 drop
Water	10 cub. cents.

If the plate has been properly exposed the image will at once become apparent, and strengthen of itself on further treatment. The developer soon becomes a brownish tint, but this is a matter of no moment. The fixing is undertaken in the ordinary way.

Bromide plates of this kind work better than tannin plates. If photographers will only try the process they will succeed straight off. Clean manipulation is, of course, necessary. Those who are unable to produce clean wet plates should not take to dry plate photography. Emulsion plates are rather more difficult of preparation, but the careful operator will find them as easy to produce as wet plates. The Singer dry process is most to be recommended; it is the simplest of all, gives good results, and the plates are little inferior to wet ones.

A MULTIPLYING CAMERA.

To English readers an allusion to Texas chiefly brings suggestions of extensive prairie, wild mustangs, and reckless riders with long lassoes. Texas has, however, its ingenious photographers as well. Here is a communcation from Messrs. Jones and Moffatt, a photographic firm, to our Philadelphia contemporary:—

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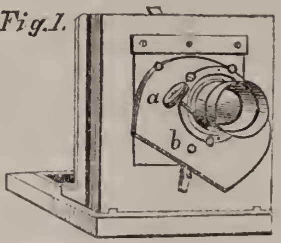
[*] *Photographische Notizen.*

"We in Texas are, as a fraternity, poor, and some of us young in the business; hence economy is a very important element to success. Therefore, with the hope of benefiting some of your readers who are in moderate circumstances like ourselves, we send you for publication a description and diagrams of a little invention made by ourselves, and which has been the outgrowth of necessity, the common parent of all improvements. This invention might be called a rotary lens, or rather a rotary flange-head. The contrivance is original with us, but may have been brought out by some one else, and patented, for all we know. If it has, we have not seen or heard of it. Still the thing is good, and has been the means of saving money for us, and we hope it may do the same for others.

"Heretofore, nearly all contrivances for increasing the number of pictures on one plate with one lens have been applied to the back end of the camera box—the sliding tablet, for instance—which, until lately, has not been free to all, and which requires considerable ingenuity to construct. Now our flange head is simple, and can be made by any one who has the least degree of ingenuity, and, besides, has some advantages over the sliding tablet, which we will not enumerate at present.

"We will now describe how to make and operate the apparatus for making two pictures on one plate, it being, in our opinion, the most practicable. Fig. 1 shows the front view of the box, with the lens placed in position for making an image on one end of the plate, the plate being placed horizontally. The lens is brought into position for the other end of the plate by moving it to that side, the piece to which the end is fastened (*a*, fig. 1) rotating on the screw *b* (fig. 1), thus describing an arc of a circle around the point *b*.

Fig. 1.



"Now, how to make one. First make a flange head to fit the box you wish to use; then take a plate the size you wish to work—a one-fourth size, for instance—and draw lines as in fig. 2, thus finding the centres, *c c*, of the two halves. Now measure the distance from *c* to *c*. Find the centre of the flange head *c*, fig. 3. Then mark a point at the right and one at the left of this centre, both the same distance from it, and from each other the same distance that the points *c* and *c* (fig. 2) are apart. Around each of these points (*a* and *b*, fig. 3) describe circles the size of the back end of the lens, or a little larger, to permit of the lens working freely. Mark a point *d*, fig. 3, exactly under the centre of the flange head. This is where the screw is placed on which the piece to which the lens is fastened moves. Next cut out the small circles, and that part between them and the dotted lines (fig. 3), and you have the flange-head properly made. Now take a piece of pine or other wood one-fourth or three-eighths of an inch thick, wide enough to extend a little below *d* and a little above the opening (fig 3.), and about twice as long as the opening, something like fig. 4. Mark a point equi-distant from the ends and near the bottom, *a* (fig. 4); also another, *b* (fig. 4), exactly above it, the same distance from it that *d* is from *a* or *b* (fig. 3). Around this last point, *b* (fig. 4) describe a circle the size to admit the free working of the back end of the lens, and cut it out. Around *a* (fig. 4) describe the part of a circle at the top, as shown by the dotted lines, and trim off the outer part to the circle, also the lower corners, if desired. Make a hole at *a* (fig. 4), for the screw to pass through, and fasten the screw to the flange-head at *d* (fig. 3), and the apparatus is ready for the lens, which can be very conveniently fastened on by three or four small screw-eyes, by which arrangement it can be removed in less than half a minute, and fastened in the same way to any other flange-head you may wish to use. Put into the flange-head two screws close to the top edge of the piece to which the lens is fastened, which will prevent the weight of the lens from pulling it forward and letting in the light. Some other device may answer in the place of the screws. Now make and place the cut-off, which is a partition in the camera (fig. 5) to keep the two images from blending, and you have your apparatus ready for business.

Fig. 2.

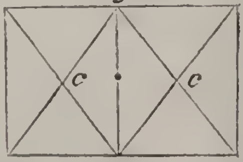


Fig. 3.

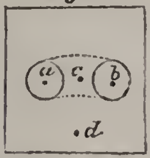


Fig. 4.

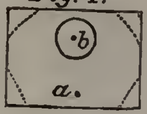
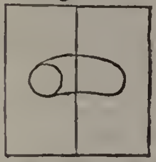


Fig. 5.



"We have described the one we are now using, and the first one we made. It is rudely constructed, but works satisfactorily, and has for six months. We use a one-half camera and a one-fourth lens. There are many little improvements that might be made to add to convenience and looks. Ours is made of pine. They can be made of some metal, and, perhaps, would work better. Be particular that the lens is the same distance from the ground-glass in both positions. If you find you are out of focus on one side, take the lens off, and make a careful measurement from the ground glass to the outside edge of the piece to which the lens is fastened, and if there is any difference, make the correction. If you are still out of focus, it may be that the sensitive surface of the plate in the plateholder, when the tablet is in position, does not come in the same plane with the inside surface of the ground-glass. The remedy for this is simple.

"We also have one constructed by which we can take four pictures on a half-size plate, using a 4-4 camera box and a one-fourth size lens. But, as we have already occupied so much of your valuable space, we will not describe it. However, if any of your readers desire a description of it, we will give it to you for publication.

"The advantages of this contrivance are many. Nearly every photographer has a one-fourth size lens. With this size he can construct the apparatus himself, which will do all the work of a double or four-tube lens of one-fourth size, and thus save an outlay of money for such lenses, which is quite an item with the poor man. It can supplant the little ninth size gem tubes now used by so many, and which all will admit are generally inferior instruments, thus making a gain of quality of work done without purchasing new instruments. Furthermore, it gives the advantage of a change of position or subject at each exposure.

"It can also be used as a stereoscopic lens with success in all cases where there are no moving objects, by simply making the two points of exposure to suit the size of the plate. In order to use it as such, it will be necessary to make a separate one for the purpose.

"Now, finally, if this proves an advantage to only a few of your readers, we will feel greatly rewarded for the little trouble to which we have been in writing this article.

"Let others who have anything which they think is good, and which will be a saving of time and money, come out with it, and let all be the partakers of the benefits."

Recent Patents.

IMPROVED FLEXIBLE SUPPORT FOR DEVELOPING CARBON PRINTS.

BY J. R. SAWYER.

The following is the text of Mr. Sawyer's specification describing his patent flexible support for developing carbon prints.

It is well known that in the operation of printing with a pellicle of gelatine and carbon or other colouring matter made sensitive to the action of light, the surface of the pellicle applied to the negative becomes insoluble, and prevents the development of the picture from the surface of the pellicle upon which the light has acted; it becomes necessary, therefore, to attach that side to some surface which will serve as the temporary support during the development, and allow of the removal of the paper or material upon which the pellicle is made, thus enabling the development to be carried from the back of the picture, which is more or less soluble, according to the amount of the penetration of the action of the light during exposure under the negative. This temporary support must be of such a nature as to enable the picture to be properly developed by immersion and washing in warm water, and yet be of such a nature as to allow the picture when properly developed to be transferred without injury to its permanent support, the conditions required being a surface sufficiently tenacious to hold the picture during development, and yet sufficiently yielding to permit its transference when completed to its final support.

My invention consists in the preparation of a surface which becomes adhesive whilst moist, and in that state holds the picture most thoroughly in every variety of gradation and detail. This surface becoming contractile when dry allows the developed print to leave it when mounted upon the paper or other material on which it is destined to remain. The material or tissue having those properties, and which I designate "temporary flexible support," I make as follows:—I take French gelatine of the best kind, and soaking it in cold water for a few minutes, by the application of gentle heat make a solution of varying strength, according to the amount of surface or polish which it is desired that the finished photograph shall possess. If I desire a dull or matt surface I make the solution of the strength of 5 per cent. or less. If I wish the surface to be highly glazed or polished, I increase the quantity of gelatine to 10 per cent. or more. To the gelatine in solution I add as much chrome alum as it will bear without becoming thick or ropy. This point, being variable with different samples of gelatine, can only be ascertained by experiment; but, as a rule, the best French gelatine made into a solution of 5 per cent. will bear about 22 grains of chrome alum to each ounce of dry gelatine employed, a 7½ per cent. about 18 grains, and a 10 per cent. about 14 grains. Having then mixed as large a proportion of chrome alum with the gelatinous solution as it will bear, I with it coat paper, either from a continuous roll or long length, on a machine with a trough constructed for the purpose, or by floating separate sheets of paper for about a minute upon the solution whilst kept warm in a shallow dish. After coating in either of these ways it is hung up to dry, spontaneously or by moderate warmth, as may be most convenient. It is then ready for the next operation; but before proceeding with that I find it a great advantage to condense the material either by passing the sheets between the plates of a rolling press, or subjecting them to the action of a powerful hydraulic press. The roll or sheets of gelatined paper are next coated either on the machine or by floating for one minute on a dish containing a solution made as follows:—I dissolve by heat one pound of lac, bleached shell or button, but by preference the best button lac, in 5 quarts of water, by adding six ounces of borax and one ounce of sub-carbonate of soda. This may be effected by boiling the ingredients together for some time, but I much prefer the following method:—Into a stout cast-iron vessel, which can be entirely closed except a safety valve, place the water having the borax and soda in solution, then put in the button lac, and raise the temperature to considerably above the ordinary boiling point; in two or three hours the solution will be complete, and the fluid should be strained through tow or cotton wool whilst still hot. When cool it is ready for use, and may be placed in the trough of the coating machine, or placed in a shallow dish and the gelatino coated paper carefully floated for about a minute upon its surface; the tissue is then hung up to dry either spontaneously or by moderate warmth, and the sheets are then milled by being passed through a rolling press between plates of polished metal.

The next operation consists in making the surface somewhat repellent to water by rubbing it over with a solution of resin in turpentine. This is prepared as follows:—To one pint of pure spirits of turpentine put half an ounce of resin, adding 10 to 20 grains of pure white wax. When dissolved it is filtered and ready for use. This preparation is to be rubbed lightly over the surface of the tissue with a piece of soft flannel, and then rubbed off as completely as possible with a second piece, and after remaining for a few minutes, to allow of the complete evaporation of the turpentine, it is ready for use as a "temporary flexible support." Its employment is as follows:—After the carbon picture is printed I take a piece of the "temporary support" cut to any size larger than the picture to be developed, and immerse both together in cold water till the tissue bearing the picture has become perfectly pliant. The prepared surface of the support is now brought into contact with the surface of the print under water, and avoiding air-bubbles. Both are lifted out together, and the adherent sheets either hung up in the air, or laid between bibulous paper for a space which may vary from ten minutes to some hours, according to convenience; but at the expiration of ten minutes the development may be proceeded with by immersing the adherent sheets in warm water at a temperature of 100 to 120 degrees Fahrenheit. In a few seconds the oozing out of the gelatine pigment at the edges is an indication that the paper at the back of the picture can be skinned off, and the development proceeded with in the usual manner by laving the print with the warm water, or allowing it to develop spontaneously by placing it face downwards and allowing it to remain for some time. The development being completed, the print is rinsed is cold water, then placed in a solution of alum of the strength of one per cent. In this it is allowed to remain for ten minutes; it is then placed in cold water, and is ready for transfer to its final support. This is accomplished by bringing the surface of the print into contact under water with the surface of the material upon which it is desired to remain. This may be either paper prepared with insoluble albumen or gelatine, or canvas, wood, ivory, glass, or any material the surface of which can be prepared with a material having a sufficiently adhesive preparation to hold the print thoroughly. When the surfaces so put together as described are perfectly dry, the temporary support may be stripped from the finished picture with the greatest care, and will be ready for use again after being rubbed over with a little of the resinous compound previously named in the manner already described.

If the exposure to light has been well timed and the development properly accomplished, the finished print will leave the temporary support quite perfect, with all its gradation of light and shade preserved, and with all the crisp definition that the negative will afford, and the surface of the print will be in accordance with the strength of the gelatine employed.

First. The perfect ease with which the primary adhesion is made.

Second. The holding power of the temporary support, doing away with all risk of washing away or blistering in development.

Third. The command over the quality of surface desired in the finished print.

Fourth. The economy of the method, which enables the comparatively inexpensive material to be used repeatedly.

Fifth. The purity of the surface and the crispness of detail, combined with the perfect gradation of light and shade incident to this method of producing prints in permanent pigments.

To Clean Bottles.—Bottles and laboratory flasks which have contained oil or fatty matter may be easily cleansed by a solution of permanganate of potassa. To remove turpentine, petroleum, photogene, &c., wash with an ounce or so of sulphuric acid, and rinse with water.—*Scientific American.*

The Photographic News.

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FADING OF SILVER PRINTS.

Another veteran photographer and distinguished portraitist adds his testimony this week to the hopeless uncertainty of photographers as to permanency in silver prints, and he feels bound to own that "in spite of every conceivable precaution, uncertainty of result seems rather to increase than diminish with increased years of experience, and that care and trouble produce no fruit but bitterness!" He also adds his testimony to that already given to the effect that not only does the attainment of certainty as to the causes of fading appear more distant, but that modern prints are not so uniformly permanent as those of many years ago.

With the tenderness of a first love, or the lingering forbearance of a parent towards an unmanageable child, he still engages, like many more, however, in a search of some method of overcoming this waywardness. Amongst many valuable observations and suggestions in his paper, a definite recognition is made of the fact that we have recently been enforcing on our readers, namely, that the chief cause of modern instability is the wholesale method of fixation adopted—almost inevitably adopted, we might say—in completing large numbers of prints. Our experience has shown that the large and important prints produced by different photographers as specimens, receiving especial care and individual treatment, remain in many cases permanent; whilst prints produced commercially, immersed in batches in the fixing solution, fare altogether differently. Mr. Blanchard points out a fact, which the experience of most photographers will confirm, "that one or two prints fixed in a new preparation of hyposulphite take altogether a different tone to that given when a moderately large batch is fixed in a solution of the same strength." In short, he arrives at the conclusion that when many prints are immersed at once in the fixing bath, a certain amount of sulphur toning takes place, the prints acquiring the elements of final decay from a gradual decomposition of the hyposulphite solution. His argument derived from this is, the importance of returning as nearly as possible to detailed fixing: that is, immersing a few prints at a time in the hyposulphite solution, and changing the solution for each small batch. In this, as well as in the various other suggestions made, there are doubtless aids to greater permanency, if not to anything like absolute certainty, a thing, alas! not attainable, we fear, in silver printing.

As silver printing will, notwithstanding this, fill a large space of photographic operations for many years to come, every suggestion for securing increased stability should undoubtedly be carefully considered. The Editor of our American contemporary, *Anthony's Bulletin*, whose admirable practical suggestions, the result of long experience and shrewd observation, are always worthy of attention, recently made some good remarks on fixing. Referring to the practice of adding carbonate of ammonia, or other alkalies, for the purpose of eliminating acidity from the hyposulphite solution, and preserving neutrality during the progress of fixing, he says:—"In our experience, however, we have found all caustic alkalies injurious, in consequence of their giving a rusty tone to the whites and half tones. The use of air-slaked lime, on the contrary, produces no such effect, and is equally efficacious in rendering the bath neutral, or, perhaps, slightly alkaline. We would recommend it in place of carbonate of ammonia, lime water, ammonia, or carbonate of soda." The suggestion is one easy to carry out, and we commend a trial to our readers.

◆

"LOOK PLEASANT, AND DON'T MOVE."

The stereotyped formula, repeated with unimportant variations thousands of times daily all over the world, "Now then, quite still, please, and look pleasant," will probably never be quite superseded. The injunction to be still seems so necessary, and the suggestion as to a pleasant expression so desirable, that the operator includes both in his daily round of duties without a moment's misgiving as to the wisdom of the course he pursues. That it is more a matter of habit and impulse than of intention deliberately thought out, at least in some cases, was illustrated recently by an operator engaged in taking a *post-mortem* photograph, who, previous to removing the cap from the lens, quietly said to the lifeless model he had just posed and arranged, at the same moment looking at his watch, "Quite still, please, and look pleasant." The story is told that another photographer, honoured by a command to photograph the Queen, and being very anxious to avoid the hard and at times frowning expression which so commonly characterizes her Majesty's portraits, somewhat persistently preferred his request for a pleasant look, "Your Majesty is still wearing a slightly stern expression." "I do not wish to alter my expression," was the concise and decided reply! Certain it is that the abruptly conveyed request to "look pleasant," or "wear a pleasant expression," often fails of its object. It startles the nervous sitter into an anxious expression, and sometimes into moving; whilst with more self-possessed sitters it often induces a self-conscious smirk or an inane grin. Amongst the masters of the art of portraiture, in photography as in painting, the aim is generally to secure a pleasant and natural expression, not by preferring a request that such expression shall be "worn," but making the sitter feel natural and happy. Pleasant chat, if possible, on a subject interesting to the sitter, is one of the most conducive aids to the result desired. A general gossip on portraiture is in most cases sure to be interesting at such time. Amusing anecdote on the subject is often efficient. An easy, happy confidence on the part of the operator that he is going to produce a fine portrait will materially assist in that pleasant, hopeful expression he is anxious to secure. Mons. Adam-Salomon, as we have before remarked, has a very happy knack in dealing with his sitters. He is full of light, bright, fragmentary remark and ejaculation, delivered in an easy, amusing manner all the time he is arranging the sitter, running now and then to the camera to look at the effect. And it often happens that during one of these glances at the camera, the stream of talk going on all the time, the portrait is taken without the sitter having any idea that the exposure is going on, no word of sitting still or looking pleasant having escaped him. This, of course, is only possible in very brief exposures. In other cases we have seen him secure the sitting unknown to the sitter by requesting him to try the effect of looking at him (Mons. S.) for a few moments, that he might judge of the expression. At such a time the sitter, being free from the anxiety of the fatal moment, looks up naturally and easily enough. Several of the best English photographers we know adopt similar methods, and are equally successful. Others, very skilful men, too, as photographers, after wearying the sitter by twisting and turning him backwards and forwards, and infecting him with their own anxiety, are as much surprised and grieved to find that the fine negative is spoiled by the unfortunate victim's unhappy expression, and he is pronounced forthwith a "bad sitter!"

A correspondent in our namesake, published in Chicago, has some amusing remarks on the subject. He says:—

"Brother photographers, did you ever listen to yourself when talking to your sitter? If you never did, it will pay to try the experiment; you can do this at any time, without in the least interfering with your regular business. To make this experiment complete and most edifying, take some day when you are very busy with sittings, because you will then become satisfied that you are working by rule; and it will doubtless be very gratifying to hear yourself repeating, thirty or forty times, 'without missing a note,' something like this: 'Now then, all ready, wink 's much you'r mind to, but keep perfectly still, now;" said as fast as possible. This is sometimes varied, as, for instance: 'Now then, all ready, wink your eyes as much as you please, keep perfectly still, and look right here:' the photographer was always careful to say 'wink your *eyes*'—I never heard him give the sitter permission to wink the mouth once—and he always repeated this lingo rapidly, to show the sitter he knew what he was about. Another one was in the habit of relieving himself thus: 'Now look pleasant, and keep still, ready;' and the cover was removed at once, for fear the angelic expression conjured up by his beautiful language should be lost, for everybody knows, all an operator has to do, to get a pleasant expression upon the face of his sitter, is simply to say to him or her, 'look pleasant,' and presto—it is done. But this is not always the consummation most devoutly to be wished for, as, for instance: Another knight of photography was wont to say to his sitters—placing himself squarely in front of the subject, and giving a sample of the expression sought—'Now do try to have a deep and earnest expression; if there is anything I do detest it is a silly simpering expression;' and with the conclusion of this impressive speech, as if relieved of thoughts too big for the brain, turn to his camera, and, with the air of a king, expose his plate. It is, perhaps, unnecessary for me to inform most of the readers of the NEWS that he had previously exposed a fool.

"But, perhaps, the best one for photographers to pattern after is the following. I was assured that, after trying all others, this knight of Argent had found this the best; but let no ambitious young photographer ever hope to attain success in this without dignity of carriage, character, and conduct. Thus, after, in the most dignified manner possible, placing your subject, adjusting the screens and light, focussing your camera, and placing the plate-holder in position, say impressively: 'Now sir (or madam, as the case may be), the arrangements are all completed; sit perfectly still; wink both your eyes; eyes on the glass; going, going, gone!' and with that 'gone' the instrument was uncovered and the picture started. You may be assured it was an awe-inspiring ceremony, and calculated to impress a subject with—what?

"Well, now do not allow yourselves, brother photographers, to suppose that your writer has drawn upon imagination in these examples. They are actual facts, and well paid would he feel if he could realize that they may suggest to some one who has got into a rut, the thought that our sitters are not all fools."

FADING OF SILVER PRINTS.

BY VALENTINE BLANCHARD.

SOME years ago, when I wrote on the uncertainty attached to silver printing, I was attacked by some of my friends, who said, "Whatever may be the melancholy fact with regard to the future of our productions, we do a serious wrong to the art by putting on record in the journals the naked truth about the matter." I need scarcely say that my experience in the matter of fading has been simply as bitter as that of my co-workers in the art, and that in spite of every conceivable precaution, I am bound to own the uncertainty of results seems rather to increase than to diminish with increased years of experience, and that care and trouble produce no fruit—but bitterness.

I am sorry to say my experience is the same as that of Mr. Mayland, Mr. Robinson, and many others, and goes to prove that modern prints are not so uniformly permanent as those of many years ago. The great question, therefore, is, What is the cause? It is clearly our duty to try and trace it to the root. A moment ago I wrote cause, but very little experience is needed to show that fading does not arise always from one cause. The unfortunate print is surrounded, even from the moment of its birth in the printing frame, and through the brightest of its years to the final stage of all, "the sear, the yellow leaf," by treacherous companions—or, rather, parasites—for the sulphur compounds that ally themselves with the silver and gold at the birth of the unfortunate print, and add to its strength and beauty during the palmy days, end by sapping and drinking up its vitality, and so comes destruction. I wish to dwell on some of the points that specially present themselves to me in this all-important matter, and I therefore start with this question of sulphur, for I feel sure it plays an important part in the production of even the best and most carefully-prepared prints. My reasons for this assertion I will now give.

When prints are first immersed in the hypo., we all know they change very considerably in colour, and always go many shades redder than when they left the toning bath. After a time, however, when a considerable number have been immersed in the hypo., the rich purple comes back again. Why is this? I have no doubt whatever that the free silver still left in the print combines with the hypo., and aids the gold tone by a compound of sulphur and silver.

I have tried many experiments lately with different kinds of toning, and I find that *one or two prints fixed in a new preparation of hypo take altogether a different tone to that given when a moderately large batch is fixed in a solution of the same strength.* I have marked this in italics, for I feel sure we have here one of the most notable causes of fading. Now it is undoubtedly clear that modern prints are not, as a rule, so stable as more ancient productions. The point, therefore, is, In what way are our operations different? Modern papers, of foreign manufacture, have come in for their share of the blame, and in some cases rightly, too; but the decomposed albumen, so much censured, is not the only cause. I have found that the brilliant surface given by some of the papers has been accompanied by another peculiarity as compared against that of papers of older make. It does not, after the preliminary washing, change much to *red*, and does not appear to need much toning. Now herein is contained a grave fault. Gold is stable; therefore the more completely we can substitute gold for silver, the more permanent must be our productions. In the old days, when the present method of gold toning was first introduced, it was recommended to give to the prints, after three or four changes of water, a bath of salt and water, to convert any free silver remaining into chloride of silver. We all know, when this was completely done, how much longer it took to change the vivid brick-red of the print into the more agreeable purple. I feel certain, however, that the method then employed was nearer the mark than the present one. I am sure I am right in saying that the common practice with the mass of photographers who employ the acetate bath is to use it over and over again, and simply strengthen it from time to time. Why is this? Because by this plan a grain of gold can be made to tone, not simply one sheet of paper, but three sheets. How is this accomplished? I firmly believe this economical result is brought about by a compound toning bath of silver as well as gold. In a newly-prepared gold bath we find the first few prints tone slowly, but after a short time the bath starts into action. Why is this? Surely silver, from the first prints immersed, and possibly sulphur also, from the albumen, help to produce this result.

Much has been said about the injurious action of various mounting materials, cards, &c., and with justice, too; for I have bitter experience in the matter of cards; but I feel sure, as long as we are compelled to employ silver printing, we should do well to go back over old ground. If we were to be content to use paper with a less highly glazed surface, and containing salts, to give a red rather than a purple tone in the printing-frame—to adopt every means possible to make the toning an *honest* deposit of gold—to be most careful not to put too many prints in a limited quantity of hypo—we should at any rate have more certainty of result than we have at present.

Some time ago, when the question of fresh *versus* stale albumen was the topic in the journals, I called attention to some prints made upon a foreign paper—I think it was called Schering's Imperial; at any rate, its odour was more unpleasant than any I have smelt since. These prints are all remarkably permanent. On thinking the matter over lately, I remember these peculiarities about the paper: it was thin, and of very fine texture, but was not at all highly glazed, and it was only after the completed picture was rolled that the beauty of detail came out. During all the processes, up to the last one of rolling, the results were rather disappointing. In those days, however, to secure the rich, warm black of the lime toning bath was my great aim, and this paper helped me to my result perfectly. Should we not do well to give up the fleeting beauty of the warm, rich brown, and go back again to the most perfect warm black we can secure, of course taking every possible care that this is secured by an honest deposit of gold?

In conclusion, I would like to call attention to the fact that papers prepared for keeping, in which the free silver is converted into citrate of silver, are much more difficult to tone, for it will be found by those who have used them that the colour in the printing frame is a fine rich red, and in the preliminary washings this colour is increased. In a good toning bath, *liberally supplied with gold*, no difficulty will be found in securing a really fine warm purple, and this colour does not change so rapidly on the first mmersion in the hypo bath as with the ordinary papers.

SOME PRACTICAL HINTS ON CARBON PRINTING.

BY F. BAUM.

The admirable series of articles just completed by Mr. Howard on what I may term the theory of carbon printing, gave me the idea that a few hints on the practice of it would be acceptable to some of your readers.

In introducing the chromotype process into my studios, many difficulties presented themselves, all of which having now been overcome, a careful attention to the following remarks will, perhaps, save beginners from a good many failures, although in this, as in most things worth having, patience is required, together with perseverance, but is amply repaid by eventual success.

What will most strike the beginner is that, seemingly, the same manipulation should at first result in failure, but soon after in success; but depend upon it there was something in that same manipulation at first that was different to the later trials, a subtle something, not to be defined (or, call it knack if you will), but, nevertheless, present.

Now let us proceed to sensitize our tissue in—

Bichromate of potash	1 ounce
Water	25 ounces
Ammonia...	10 drops.

Or, instead of the bichromate of potash, the same quantity of the Autotype sensitizer, a mixture of the former and ammonium bichromate.

A tin dish is a very suitable vessel in which to sensitize, one 31 by 16, a very handy size, just large enough to take the full width of the tissue by fifteen inches long. The dish should be about two inches deep, and about fifty ounces of solution should be used. A band of tissue will be a fair quantity to immerse in this, but it must be done within a week after the first piece is immersed in it; if not, it must be rejected at the end of that time, and a fresh solution made.

It is impossible to give a correct idea of the length of time for sensitizing, as it varies from thirty seconds to three minutes; but a safe guide will be, that as soon as the edges begin to show the least tendency to curl outwards, remove the tissue, which is best done by getting a thin lath of wood, fixing the tissue on with carpet pins (it will be well to double the corners whereby it is fixed, as it is very tender) or American clips, and draw gently along the edge of the dish with the left hand, to remove excess of liquid from the front, using a squeegee or smooth piece of wood with the right hand, to serve the same purpose at the back, and hang up to dry. Some care should be exercised in this; if not, it will dry unevenly, and the result may not be so satisfactory. While still in the solution, pass a sponge over the front of the tissue, to remove any dirt or particles of paper and fluff that may have adhered to it, as nothing will remove them afterwards. The time of drying will depend on the amount of moisture in the atmosphere. In winter, and during the prevalence of north and easterly winds, the tissue soon dries—in fact, care must then be taken not to leave it too long, as it is apt to get so dry as to be unmanageable, cracking at the least touch or attempt to roll or fold it up. Four hours will often be sufficient then, while at other times it has taken eighteen hours. Both these are extremes, though, in an ordinary room without special appliances, it will average nine hours. If hot water pipes, or artificial means, are used for heating the drying room, the temperature should not be allowed to rise above 70°, as the tissue would then begin to melt.

An ordinary dark room is not very suitable for drying, as there are generally so many vapours about, exposure to which renders the tissue partially insoluble, making it impossible to get pure whites in the finished print. The sensitizing can be carried on in the light; unlike silver, the tissue does not become sensitive as soon as prepared, or while still wet. When it is only moist, however, it should be carefully kept from the light, as it is then in its most sensitive state, and perhaps three times as sensitive as silvered paper.

It must be carefully borne in mind that all kinds of noxious vapours are very injurious. Sewer gases, bad smells, smoke from fires or gas, &c., have all the property of rendering the tissue insoluble to a certain degree. To my mind, not sufficient stress has been laid upon this, and a great deal of the blame now cast on the manufacturer of the tissue would more properly belong to a neglect of precautions; in this respect it is of the highest importance, as however well all subsequent operations are conducted, the result will be something like failure if this be neglected.

In summer it will sometimes be necessary to put a piece of ice in the sensitizing solution, which should not exceed 60° Fah.; this will occur but seldom, though.

The tissue is best immersed, and also easiest to prepare in that way. For special or peculiar effect, it should be floated pigment side down for extra softness, or pigment side up for greater contrast.

It is important to immerse the proper time; if not long enough, the print will be uneven and too light, making it appear as if the printing were at fault; if too long, it will become difficult to manipulate, and refuse to adhere to the provisional support; the happy medium will soon be found out in practice. A time test is of no use at all, and, as previously mentioned, as soon as, or rather before, the tissue begins to curl outwards, it should be removed.

It is also very important to make the solution always of exactly the same strength, much more important than with silver solutions, as these can be watched in printing, but in this case it would add immensely to the difficulties of getting the proper exposure if the pigment to be exposed were of a more variable sensitiveness than it already is from its nature under different circumstances of temperature.

CAUSES OF FAILURE IN THE PREPARATION OF EMULSIONS.

BY M. ROSSIGNOL.*

THE present wet collodion process differs but little from the method indicated in 1850 by Legray, and described in 1852 by Scott-Archer. The manipulations are the same, and the only modifications are a few changes in the formulæ that are used. But the ordinary way of preparing a sensitive film is delicate and complicated, especially when it is a question of preparing dry plates, and everybody is conversant with the uncertainty and irregularity of the result.

It is obvious that the employment of a mixture enclosing silver salts is a more simple plan of working, and it was to elaborate such a process that the efforts of Messrs. Sayce, Bolton, Carey Lea, Wortley, and others have been directed in preparing emulsions.

But it does not suffice, as some might think, to sensitize a good ordinary collodion by adding to it a suitable quantity of nitrate of silver. The product thus obtained is far from combining within it all the qualities of uniformity, durability, delicacy, and sensitiveness, which are indispensable to its employment in ordinary use. Dr. Van Monckhoven says very truly that the emulsion process is a difficult one. The least defect in the formula is sufficient to produce too weak a film.

I myself have made some exhaustive experiments with emulsions; I have essayed the formulæ mentioned by the most experienced, and I have consulted most of the original communications on the subject. But whether by reason of errors in the figures given, or differences in the chemical composition of the product, or, perhaps, the special circumstances under which the work has been done, I have never secured results of an altogether satisfactory character. The best formula, to my thinking, is that published by Carey Lea. It is probable, nevertheless, that the communication of this learned chemist was incomplete, for the final product will not keep, while its properties vary between the most extended limits.

At this day, therefore, we are still in want of a sure method for the preparation of emulsions. The process has, as yet, only been applied for the preparation of dry plates with alkaline development. Now, according to my researches, the emulsion process may be applied to all methods, dry or wet, upon glass or upon paper, and the film may be treated either with alkaline or the ordinary sulphate of iron developer. But the first condition of success is to procure chemical products of the purest and most neutral character, and it is perhaps just this condition that is the most difficult of fulfilment.

Thus proxyline does not happen to be a product of a definite character, but a mixture in variable proportions of cellulose, more or less nitrated. Moreover, it is often imperfectly freed from excess of acids, which penetrate the fibre of the cotton. In this case the gun-cotton is liable to decompose spontaneously under the action of light, and afterwards react upon the substances which constitute the emulsion.

The solvents that are ordinarily used, alcohol and ether, should, for emulsion purposes, be rectified with the greatest care, and be perfectly exempt from organic matter, such as amylic alcohol, acetic and ethylic-sulphuric acid, acetone, &c., and this is rarely the case.

Again, it is very rare to meet with chemically pure bromides, chlorides, and iodides, for while some nearly always contain oxide, others are apt to decompose in air. It is for this reason that cadmium collodion becomes white, and ammonium collodion grows red. Nitrate of silver itself, often acid when it is crystallized, is almost alkaline in a fused condition. All these discrepancies, although insignificant, apparently, cannot be neglected with impunity in the preparation of emulsion.

It is necessary, moreover, in order to secure success, to combine proportions with the utmost accuracy, otherwise a permanent emulsion will not be secured. At the forthcoming competition of processes to be held by the French Photographic Society, I propose to make known my precise method of working, which permits me to secure the most irreproachable products.

ON A SIMPLE, EASY, AND CERTAIN METHOD OF PRODUCING CARBON TRANSPARENCIES SUITABLE FOR ENLARGING.

BY FRANK DORE.

A GREAT deal has been written of late respecting the various methods of producing transparencies suitable for enlarging: first, comes the ordinary method, by wet collodion; next, the beautiful collodio-albumen; lastly, the most simple, and which produces results that no other method can surpass—viz., carbon. No doubt, under very favourable circumstances, the wet process, with pyro or gelatino-iron developer, will produce results tolerably satisfactory; in fact, up to say twelve by ten from quarter-plate, I have produced good results; next follows the albumen, which nothing can surpass for delicacy of texture, but it requires very great care in the preparation of the plates, or the result will be covered with pinholes, which, if enlarged from quarter-size to twenty-four by twenty, require a great deal of spotting-out.

Nothing has been published really practical respecting carbon, excepting by Mr. G. W. Webster, in 1875, and by Mr. G. Willis, in this YEAR-BOOK, viz., by coating the plate with a solution of gelatine rendered insoluble by the addition of chrome alum. I have spent a great deal of time during the last two years in endeavouring to get at the most satisfactory method of attaching the tissue to the glass plate previous to development. I found it impossible to get it to adhere to glass without markings or blisters occurring, even if the plate received a substratum of collodion, so I abandoned glass as a support for a time, and employed talc, by immersing a sheet underneath the tissue in the bichromate bath, bringing them in contact; when the tissue had been in about half-a-minute, gently withdrawing together, and firmly pressing with a squeegee, then placed away to dry, cleaned the front of talc, and printed through. When these transparencies were developed they were all that could be desired. Still I did not feel satisfied, as talc is expensive to get in perfect sheets. So a thought occurred to me to give the printed tissue a coating of collodion. I had the secret of success at once. The following is my method of procedure.

After taking the tissue from the printing-frame, I pin it on to a thin piece of board, so that it lay perfectly flat. Keeping the pin a little from the corner you wish to pour off at, now coat the printed tissue with a thin coat of plain collodion, the same as you would a plate; when set, but not dry, immerse in a dish of clean cold water; now take a clean plate, and coat with collodion also; as soon as set, immerse the plate in the dish of water with tissue, let them remain for a short time, and wash until all greasiness disappears; now bring the collodionized tissue in contact with the collodion plate under water, withdraw them, carefully place between a few sheets of blotting-paper, with a piece of india-rubber cloth on top, and press carefully together with squeegee; now place on one side for about a quarter of an hour, then develop with warm water, and if properly exposed, you will find you have a perfect carbon transparency suitable for making excellent enlargements.

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* *Moniteur de la Photographie.*

Correspondence.

HINTS TO INTENDING TOURISTS.

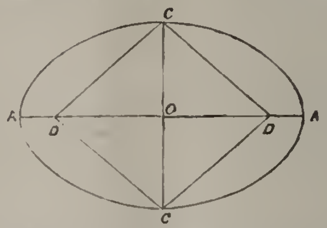
Dear Sir,—Once more we have at least the hope of summer before us, and no doubt those of our brother professors of the black art, whether amateurs or otherwise, who have cash in their pockets, and time to spare, are now preparing for their annual recreation. To those who have not before been over the ground, I should say that they will hardly find a better field for their labour than this county. The beauty and diversity of its scenery beggars description. In North Devon the means of transit are being rapidly improved, especially the Ferry between Instow and Appledore; where, at certain states of the tide, the passengers were obliged to be carried ashore on the backs of the boatmen, there will now be a steam ferry boat and convenient pier. It is a pity that tourists do not visit this part earlier; they would find accommodation cheaper, and the climate now more suitable both for health and photography than in the extreme heat of summer. In connection with the useful idea of the guide, perhaps a few hints from an old hand may prove serviceable to some. The first thing to be considered is the weight of the impedimenta that the tourist may be able to carry, without making a toil of a pleasure. He may be considered as a person whose habits during the greater part of the year are of a sedentary description. The muscles, even of the strongest, will, under such circumstances, become relaxed, and unable to sustain sudden and violent exertion. The soldier, trained for the purposes of war to march under a considerable weight, carries altogether about sixty pounds, and an ordinary day's march is from eight to twelve miles, a forced march twenty miles; and these are so planned, if possible, as to be performed in the cool of the early morning. Your readers will at once see that persons answering to the description above given must be unequal to undergo the robust exercise which to the latter would be a mere bagatelle; therefore I should advise the tourist to restrict himself to about the weight of ten pounds at the utmost. The next thing to be considered is what description of picture, and what process, will admit of the necessary apparatus being confined within the prescribed weight. I must premise that recommendations apply to those tourists who intend to be self-reliant. I should consider that a camera capable of taking pictures eight and a-half by four and a-half, or two stereoscopics with a wide angle, two stereo lenses, and changing box containing one dozen dry plates, might be contained in a light wallet, and carried slung by a strap over the shoulder, and would prove all that could be desirable. On the top of this might also be carried a folding tripod having a small universal joint screwing into the bottom of the camera, instead of the usual brass ring, which, except for large cameras, I consider altogether a mistake for field work. The legs of the tripod should each be bored through at about half way down, so that a cord might be passed through the holes, and regulated at pleasure. This would serve to prevent the tripod slipping on pavements or rocks, and also to tie it together when not in use. The process I should choose, I need hardly say, would be one of the most rapid dry ones. Thanks to improvements, by some of these the influence of the wind and the motion of waves may almost be set at naught. It will be seen that thus all outdoor operations are reduced to taking of the pictures and changing the plates. The tourist having chosen the direction of his trip, I should advise him to take up his location in some central town, from whence he could make excursions in the surrounding neighbourhood, choosing, in preference, a lodging of moderate pretensions, taking care that he can have necessary convenience for preparing fresh plates, developing, &c. He had better, particularly if he is young in the art, take care to completely finish his pictures before leaving the neighbourhood: doing this will afford him pleasant employment for unpropitious weather.—I am, dear sir, yours truly, James Martin.

5, Clarence Cottage, Ilfracombe, May 15th.

TO MAKE AN ELLIPSE.

Sir,—In reading through the Year-Book, I saw a method of getting a true oval; but there is a slight mistake in it, correcting which will make it much plainer to those who try it. The point spoken of by W. Davies as being the foci is not correct, but the places at which you must place your pins are the foci. I have put it plainly, I think, in diagram.

Draw two lines at right angles to each other; mark off A A and C C from O, half the size of ellipse you require; take half the longest line A O, and from C C mark off this length, which will be D D, the foci. Put your pins at these points, and tie your string long enough to go round the two pins and reach to C. The only addition to the description given by Mr. Davies is the place to put the pins. C. J. Farlie.



75, Wellington Street, Woolwich.

VALUE OF SILVER RESIDUES.

Sir,—I have only just noticed the article which appeared in your issue of May 12th under above heading.

The value of chloride of silver quoted at 160 marks the kilo. would not be 80s. per pound, but about 72s. per pound avoirdupois, or 59s. 3d. per pound troy, which is more than the value of pure metallic silver at the present time.—Yours truly, J. G. J.

AN EXCELLENT PLATE-CLEANING SOLUTION.

Dear Sir,—I have found the following a most excellent method of cleaning plates. I fancy it appeared in the Year-Book of Photography, or in the *British Journal*, but as many photographers may not be acquainted with it, I should strongly recommend it to them. Mix

Alcohol	½ ounce
Acetic acid	½ ounce

To clean the plate, drop a few drops of this on it (about four for a quarter-plate) and rub it all over with a piece of rag until it ceases to bite; then polish with a silk handkerchief or piece of wash-leather, and the plate will be found to be beautifully cleaned.

I find this method especially useful on account of the plate requiring no washing, and also it cleans it better than the ordinary way with tripoli, and takes about half the time, and there is no fear of getting particles of tripoli into the bath.

I feel sure that those photographers who adopt this plan of cleaning their plates will find it very useful, as it does away with a lot of tedious work, and also saves a lot of time.—Yours truly, R. N. P.

FAILURES WITH STRONG ALKALINE DEVELOPER.

Sir,—On very many occasions during the last twelve months Colonel Wortley has been at great pains to enforce the fact that dry plates prepared by bath processes can be developed and intensified to printing density by the employment of an 80-grain solution of carbonate of ammonia and pyrogallic acid alone—*i.e.*, without the necessity of intensifying with silver and pyro in the usual way.

That there may be no mistake, allow me to quote from the News of 21st Jan. last, page 27, lines 18 to 23:—"Thus while one minim of a 48-grain solution per half ounce of carbonate of ammonia solution will give an exceedingly delicate transparency, 20 minims of the same solution with the same amount of ammonia will give a very rich dense negative."

That a dense negative can be obtained by the emulsion processes in the above manner is beyond dispute, because such plates contain within themselves the elements necessary for the purpose; but I should be very happy to know whether any worker of Captain Abney's process, in which all free silver is got rid of, has ever been able to obtain sufficient printing intensity without the aid of silver and pyrogallic acid. I have been lately experimenting a good deal, and, though I succeed when I use Abney's method of developing, I can never get beyond the phantom stage with ammonia and pyro alone.

If anyone can point out why I fail, I shall esteem it a great favour.—I am, sir, your obedient servant, F. Y.

Ryde, May 17, 1876.

[In our seventeenth volume our correspondent will find various articles on this subject. Mr. R. Manners-Gordon developed gum-gallic plates successfully with the strong alkaline developer, attaining printing strength without difficulty. Possibly some of our readers who have had varied personal experience in working with this developer may suggest a cause for the failures above indicated.—Ed.]

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The usual meeting of this association was held on Tuesday evening, the 30th inst., at the Free Public Library and Museum, the President, Mr. W. Atkins, in the chair.

The minutes of the previous meeting were read and passed.

A resolution was passed, "That until the end of the year the meetings shall be held on the last Thursday in each month, instead of the last Tuesday in each month." The change of evening was made in order to facilitate the arrangements of the Liverpool School of Science Committee.

Mr. W. H. Kirby exhibited some prints and the negative of the solar spectrum, showing many of the Fraunhofer lines.

Mr. J. H. T. **Ellerbeck** gave his experience with Mr. M. Carey Lea's collo-developer. He found that with a developer prepared with some which he had brought he was enabled to obtain negatives with half the exposure obtainable with the usual acetic acid developer; another sample, however, prepared by another maker, took the same time. He (Mr. Ellerbeck) showed examples to prove that a reproduced negative, much softer than the original negative, could be produced by using the autotype transparency tissue first to obtain a transparency, and then again from that to obtain a negative.

Copies of the presentation prints for 1875 and 1876 were exhibited, and were examined with great interest and admiration.

The **Secretary** then gave an account of the proceedings of the Council regarding the choice of the presentation prints.

Both pictures had been enlarged with much care by the Autotype Company from negatives taken by Mr. O. R. Green during his "Run for Sunshine." Mr. Green had, with his usual kindness, placed his negatives at the disposal of the Association for the production of their presentation prints.

The print for 1875 is a "View of the Tibee from Ponte Rotto," enlarged from two negatives 7½ by 5 to 24 by 10. The difficult task of joining these two negatives to form one enlargement had been most successfully overcome by the Autotype Company.

The print for 1876 is a "View of the Forum at Rome," from a point of view from which many interesting spots may be noted. This is also a most successful enlargement, 23 by 18, from a negative 7½ by 5. They are both printed in permanent autotype.

The success of these enlargements will, no doubt, give as much pleasure to Mr. Green—who has taken so much trouble to produce them—as it is to the members to obtain possession of such magnificent specimens of their art, as, without doubt, they are the finest presentation prints the Association have had.

The Rev. H. J. **Palmer** said no doubt he had the unanimous feeling of the members in expressing himself as greatly delighted at the choice of the pictures, and he begged to move a most hearty vote of thanks to Mr. Green for the opportunity he had given them of having such valuable photographs. The vote was carried by acclamation.

The Rev. H. J. Palmer during the evening took three groups of the members on plates prepared by the gelatine process some six months ago.

The **President**, in moving a vote of thanks to Mr. Palmer, said that it always enhanced the interest of the meetings when members could see some practical work going on.

The meeting was shortly afterwards adjourned to Thursday evening, the 29th of June.

Talk in the Studio.

South London Photographic Society.—At the next meeting of this Society, to be held in the Rooms of the Society of Arts, Adelphi, on Thursday, June 8th, Mr. Aldridge will read a paper "On Obstacles to Photographic Progress."

Mr. Macdona's Plate-holder.—Mr. J. Henley writes to say that he has had a plate-holder similar to that described by Mr. Macdona in our last in use for some years, and finds it invaluable.

Novel Photographic Exhibition.—A few days ago a photographic exhibition of a novel and interesting character took place at Miss Rye's "Home for Destitute Little Girls," Peckham. The attention of visitors was not drawn to this collection of six hundred photographs for their artistic excellence, though many might be commended on this ground, but as an example of what good conditions of life may do for the very poorest and lowest waifs and strays from our workhouses and streets. The photographs have been sent from Canada to Miss Rye, some by the girls themselves, others by the adopted parents or mistresses of the children, and in every case it has been done voluntarily.

Convocation Photographed.—The Lower House of Convocation has lately been photographed in groups by Mr. S. A. Walker, of Margaret Street, Cavendish Square. One group shows the prolocutor and his assessors; another, the deans and archdeacons; another, the proctors for the cathedral chapters and proctors for the clergy; and another, the members of the Lower House. The photographs were taken in the courtyard of the anteroom leading to the Jerusalem Chamber. The grouping is effective, and most of the portraits are distinctly brought out.

Photography on Board the Challenger.—A correspondent of the *Daily News* says:—"The photographs are full of interest, and, although often taken under very difficult circumstances, are exceedingly well executed. Strange places and stranger people are preserved for ever in the photographic log of the *Challenger*. Shock-headed groups from the Arau Islands, Zamboangan villages precisely resembling those the relics of which are found in the Swiss lakes, views of streets in Manila which vividly recall the well-known features of Venice, portraits of Japanese and Tahitian beauties side by side with the broad face of Queen Charlotte of Tongatabu, and grand landscapes and seascapes—the great crater of Kilauea in the Sandwich Islands, the desolate rocks of St. Paul, the 'stone rivers' of the Falkland Islands, the great glacier at Port Churruca, beautiful scenes in the Straits of Magellan, a delicious bathing place in Fiji, scenes from the nutmeg, pepper, and cocoa groves of the Indian Archipelago, and from the savage solitudes of Tristan d'Acunha."—"At Nare's Harbour, at the Admiralty Islands," says the correspondent of another daily contemporary, "the natives were friendly, and came on board freely. The photographic camera was to them a source of much dread, and it was only when Captain Thomson allayed their fears by squatting amongst them that the apparatus could be used. The collection of photographs of noticeable places and objects *en route* is of great value. It is so extensive that some days might be well employed in scanning the pictures; even an enumeration of them would be inconveniently long. To see them is well worth a journey to Sheerness."

Publishing the English Patents.—The *Scientific American* says:—"The London Patent Office is about to adopt our Patent Office system of producing copies of drawings of patents by the photo-lithographic process, in place of the large lithographic sheets which now accompany the printed specifications of all English patents. Considerable opposition to this change was made by the London patent agents; but we believe it only arose from abhorrence of change, which is the national characteristic of the Englishman. But the British public will soon find our mode of producing copies far better than their old plan of lithography."

N. S. Wales at Philadelphia.—A Sydney journal says:—"Mr. B. C. Holtermann, of St. Leonard's, Sydney, a wealthy amateur photographer, is making a very extensive collection of photographs of the scenery and public buildings of New South Wales and Victoria. He has already expended nearly £4,000 in carrying out his project, and has obtained between 1,000 and 1,500 different negatives, some of them of a great size. He is assisted by Mr. C. Bayliss, who has succeeded in obtaining what is said to be the largest negative in the world. It is a view of Sydney taken from the North Shore, and its size 5 feet 6 inches by 3 feet 2 inches. It is taken on a sheet of plate-glass weighing 80 pounds. Notwithstanding the immense size of the photograph, the buildings, trees, and shipping came out most distinctly. Mr. Bayliss has also obtained a complete panoramic view of Melbourne. Mr. Holtermann intends to exhibit his collection at the Philadelphia Exhibition, and after visiting Europe for the purpose of ascertaining the latest improvements in the photographic art, he will return to Sydney, and there perfect his collection of Australasian views. He contemplates at some future time exhibiting his complete collection in England and on the Continent of Europe."

Blue Prints.—A solution of iodide of potassium is slowly decomposed by the action of light; but when some cane sugar is added, it turns yellow, owing to the liberation of iodine. If starch is present, a blue colour is produced. If a sheet of starched paper is soaked in a solution of iodide of potassium and sugar in the dark, and then exposed under a photographic negative to light, a blue positive print is obtained, which is fixed by washing in water.—*Scientific American.*

To Correspondents.

South Devon.—Any of the refiners whose announcements appear from time to time in our advertising columns will undertake the task of separating your gold from the silver.

N. W.—If you send the prints with full instructions, and one shilling and threepence for each, to our Publishers, they will take the proper steps for registration.

Aurine.—Nothing is more easy than the preparation of a yellow non-actinic varnish for the dark room window. The addition of a yellow or red resin, like dragon's blood or gamboge, to common varnish used by painters, or to white hard varnish, will serve; but there is some risk of such colours fading and requiring renewing. Orange chrome so added is very non-actinic, and will stand well. Probably aurine will answer. The chief point you seem to require is the use of a resinous varnish instead of dextrine, gelatine, collodion, &c.

Chemicus.—The term sal soda, used by American writers, is applied to the common carbonate of soda.

Abram.—So far as we know, there is no law which will interfere with the production of a nude photograph in the ordinary practice of business. The issue, publication, sale, or exhibition of indecent photographs would be punishable under Lord Campbell's Act; but the production of (say) anatomical photographs would not come within the category.

M. G. C.—Bromide of silver is soluble to such a very slight extent in a solution of nitrate of silver, that it is probable no observable result would follow your mistake; and the conditions which have followed have probably no connection whatever with the addition of the bromide. Neutralizing and sunning will probably be beneficial. We should not regard a wooden bath merely varnished inside as at all safe for use for holding a solution for negatives. It should be lined with glass. Possibly a good thick coating of paraffine might make it safe for use.

G. D. R.—The bleached meally effect of your prints is due to the use of a toning bath too soon after it was mixed. This is a common defect of the toning bath prepared with carbonate of soda. It is difficult to indicate the precise time, as that will vary with the amount of soda used, the amount of free acid in the gold, the temperature, &c. If used too soon it will bleach, if not soon enough it is slow and inert. A good impromptu bath is made by mixing a grain of chloride of gold in a drachm of water, with sufficient prepared chalk to make it into a creamy paste. Then pour six ounces of hot water upon it, at about 180° Fah. When it is cold it is fit for use.

B. L.—There are various causes for lack of intensity in a negative, and various modes of securing greater intensity. The use of a new thin collodion is one of the most common causes of thin images. The addition of a portion of a riper collodion will be useful under such circumstances. Or sometimes the addition of about one grain per ounce of pyroxylin to the collodion. The use of a small stop, or working in a dull light, tends to produce weak negatives. Washing the free nitrate off the plate, by using too much of the developer, and throwing it on the plate with a sweep, so as to wash it over the sides of the glass, will frequently cause lack of intensity. The addition of a grain of gelatine to ten ounces of developer will sometimes increase intensity. The use of a weak developer, and slow development, will frequently help you.

John Henley.—Many thanks. We shall at all times be glad to receive hints derived from experience. Matters apparently very small are often interesting to others under whose attention they have not come.

Constant Reader (Rotherham).—You may rest assured there is no fault in your lens. The instrument which at times gives sharp pictures will always do so, if properly used. The source of error is in the focussing. Varying conditions of the eyes, and more especially of the nervous system, most materially affect the powers of individuals to focus properly. One remedy consists in the use of a focussing glass—that is, a magnifying glass which, placed in contact with the ground glass, will enable you to see much better the precise focus obtained. In the examples sent, those with the head a little out of focus have the focus of the lens too much in advance. A single turn of the pinion, throwing the focus further back, would have produced a perfect result. The definition is not very bad as it is. The others are, as you say, quite sharp enough for pictorial purposes. Regarding the stains which used to trouble you, if you have got rid of them by using the developer you name, you must rest satisfied. The proportion of alcohol you name is by no means a large one; but, on the contrary, below the usual proportion. Your work is fully up to the general average.

J. F. N.—The mode of treating a bath to which you refer is one we do not approve. The addition of acetic acid to a negative bath almost invariably brings a series of troubles, as it is very difficult, if not impossible, by any treatment available to the photographer, to remove, and any attempt to neutralize it issues in the formation of acetate of silver—with which your bath is now charged—and causes it to give the hard negatives you describe. It is almost useless to attempt to doctor it; the best plan will be to place it among the residues. The addition of a few drops of a solution of cyanide, sunning, and filtering, are often very useful in restoring a bath; but always shun the acetic acid for the negative solution.

Frank Dore, J. Y. Hunter, and Thomas Sims.—Many thanks.

Several correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. F. Downer, Watford,
Photograph of Mr. Hobson's Coach (London and Watford) changing horses.
Mr. J. F. Long, Exeter,
Two Photographs of Mr. Robinson Watson.

The Photographic News, June 9, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography in the Law Courts—Photography and Torpedo Warfare—The Grand Exhibition at South Kensington.

Photography in the Law Courts.—The important evidence which photography can furnish was amply demonstrated last week in the trial about the Lisbon Tramways Company, when one of the counsel wished to bring forward proof that certain alterations in the original prospectus had been made by one of the defendants. The draft prospectus was not forthcoming, but someone, imagining that the document might be of use hereafter, had caused a photograph of the same to be taken, showing all the corrections of proof and alterations that had been effected. Indeed the photograph showed more; for a witness who was called was enabled, by simply looking at it, to swear to the handwriting of the person who had made some of the corrections. So that the photograph, while being altogether valueless *per se*, was quite as useful for legal purposes as the original document itself could have been, and several copies, of identically the same nature, could be placed in the hands of those interested while the evidence was being taken. It would have been well, perhaps, if the Company had taken the precaution of employing the art at the commencement of their proceedings, and had paid their contractor, as has frequently been done, according to the instalment of work performed, photographs showing the progress of the line at Lisbon being handed in with the demand for payment. This method of checking a contractor's work, when the contract is being executed in a foreign country, is one of the best that has ever been devised, and we recommend it to the better attention of those who are engaged in the superintendence of large works. One of the principal railway lines in South America was constructed and paid for under the surveillance of the camera, the Company in England only making payments on receiving the reports of the engineer coupled with pictures taken on the spot.

Photography and Torpedo Warfare.—As our readers are aware, for some years past experiments have been made in this country and abroad, in the matter of submarine explosions. Now that guns are made so heavy, and ironclads so stout, attention has been directed to the question of torpedo warfare more especially. In this country, particularly, have we sought to devise some sound method of torpedo warfare, and have experimented with submarine charges made up with various explosives with the object of finding out which exerts the greatest amount of power. The quantity of water that is displaced on an explosion furnishes a very good criterion of the amount of force expended, and our military authorities, therefore, during the course of some of the experiments, conceived the idea of having the effects of the explosion photographed. Many of our readers may remember to have seen some examples of this class of instantaneous photography, in which the huge wave, or lofty fountain, caused by the ignition of a charge under water has been cunningly depicted on a sensitive plate ere yet the magnificent phenomenon has passed away. Mr. Elwell, of Weston-super-Mare, secured a fine series of such pictures, as have also the Royal Engineers under Captain Abney, R.E., while Mr. Baden Pritchard's military photographers at Woolwich have been no less successful in demonstrating the impression caused upon a floating hulk at the moment when a torpedo explodes under her. The pictures thus taken are something more than clever photographs. They teach a good deal in showing others, who have not been so fortunate as to witness the experiments, what a formidable thing a torpedo is under certain circumstances, and what damage it can cause; but from a military point of view they are yet more instructive. As we have said, our torpedo experiments have hitherto been conducted for the purpose of discovering which explosive out of the many known in modern times—gunpowder, guncotton, picric powder, dynamite, lithofracteur, &c.—is the most suitable for submarine charges; and also at what depth these should be sunk in order to give the greatest effect. Now it may be taken for granted that the charge which makes the most disturbance—or, in other words, displaces the greatest amount of water—is the most violent in its action; and the only thing is to know how this can best be ascertained. Judging by the eye at the moment of explosion is a very rough-and-ready mode of estimating the shock, and could only be regarded as a haphazard manner of guessing. But the photographs at once supplied a means of estimation, and one, too, that was pretty accurate. The upheaving of the water shown on the photograph could be measured by means of the background and foreground with tolerable correctness, as well as its height by comparison with surrounding heights, and thus a calculation was made of the breadth of the cone of water thrown into the air and its other dimensions. Buoys previously fixed near at hand supplied a means of comparing measurements, and the photographic sketches thus secured supplied a means of valuing the effects of the charges exploded. As the base and height of the cone of water was known, it was an easy matter to calculate the actual amount of water displaced, and in this way it has been found that guncotton is the best explosive for torpedo warfare, for in this case the cone in the photograph is larger than that caused by other explosives. The British Government, therefore, have adopted guncotton (or trinitro-cellulose, as chemists have lately taken to calling it) to fill their torpedos with, and in case of war we may expect to see large quantities of the material manufactured for torpedo purposes. Dynamite and lithofracteur come very close to guncotton; gunpowder is the worst (only about a fifth as powerful as guncotton); and picric powder takes up a position between gunpowder and guncotton. Thus photography has assisted in solving a very difficult problem, and has been instrumental in deciding a point of unusual importance connected with modern warfare.

The Grand Exhibition at South Kensington.—The International Loan Exhibition of Scientific Apparatus at South Kensington does not seem to have caused much enthusiasm beyond that exhibited by a few writers on the occasion of the Queen's visit. Although there is no charge made for admission on three days of the week, and the fee is but sixpence at other times, there is no evidence of any great rush of visitors to view the microscopes under glass shades, the long brass telescopes, the elaborate astronomical apparatus, and the thousand-and-one more or less unintelligible instruments. Though the show has scarcely been open for a month, and conferences are held almost every day to endeavour to bring visitors together, the number of these has amounted to but seven hundred, eight hundred, and nine hundred per diem. Considering all the fuss that has been made over the affair, the international arrangements that were projected, the scientific embassies that were organised, and the tremendous expense incurred, the result can scarcely be regarded as the triumphant success which some of the officials connected with the collection would have us believe it is.

THE ACTION OF PRESERVATIVES UPON BROMIDE OF SILVER.

BY H. VOGEL.*

In December of last year I published a series of experiments upon the action of preservatives upon bromide of silver, and I proved that such bodies as tannin, gallic acid, pyrogallic acid, morphine, &c., which act as powerful sensitizers upon iodide of silver, only exert a mild, or in some cases an opposite, action upon bromide of silver; they render it not only not more sensitive, but sometimes actually less so. Silver albuminate and tannin yield, when employed with care, a favourable action, which, however, is not to be compared with the pronounced effect of the same bodies upon iodide of silver plates.

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* *Photographische Mittheilungen.*

These results appear to be at variance with what has hitherto been published on the subject, for the coating of plates with gum, gallic acid, tannin, &c., is universally recommended.

My assertions have been recently confirmed by Stuart Wortley, but nevertheless the matter was a puzzling one; for it was surely to be anticipated that if these bodies acted favourably upon iodide of silver, they should do the same in the case of bromide. I may here remark that all the plates with which my experiments were conducted were prepared with bromide of silver in the bath—that is, with an excess of nitrate of silver. It is known, however, that iodide of silver behaves very differently according as it is prepared with an excess of nitrate of silver, or an excess of the iodide salt. In the latter case it is almost altogether insensitive, while in the former case it is exceedingly sensitive to light.

The same may be said of bromide of silver, only here the difference between the compounds prepared with an excess of silver salt, or precipitated with an excess of bromide salt, is not so marked.

For reasons which are given below, I imagined that sentitizers would act differently upon bromide of silver prepared with an excess of bromide salt, than upon bromide of silver prepared with an excess of nitrate of silver. This idea proved correct on experiment. I prepared some bromide of silver plates with the aid of a Singer's emulsion with a small excess of chloride of calcium. These proved less sensitive than plates prepared with an excess of silver, and washed and dried. Whilst, however, the latter attained no higher degree of sensitiveness by treatment with a so-called sensitizer, the plates prepared with an excess of chloride salt proved to be much more sensitive to light when treated with tannin, pyrogallic acid, gallic acid, or morphine. The plates were so prepared that only one half of the surface was in each case covered with the preservative solution, the films being exposed when dry to the action of a plaster of Paris object, and afterwards moistened with alcohol, washed, and treated with an alkaline developer. The tannin solution employed was made up of one part tannin and fifty of water, and the gallic and pyrogallic acid solutions of one part acid to one hundred parts of water; the morphine solution consisted of two hundred parts water and one part of morphine.

The result was that the halves of the plates which had been coated developed very rapidly, with an intense image, while the uncoated film yielded but slowly a very weak and flat picture.

The favourable action of sensitizers upon bromide of silver without an excess of nitrate of silver is therefore placed beyond a doubt. To get at the reason why organic sensitizers act so differently upon bromide of silver, according as this is prepared one way or the other, we must seek it exclusively in the particular action of the organic bodies upon nitrate of silver.

If bromide of silver plates are prepared in a bath and washed, there always remains, no matter how perfectly the washing operation is performed, a trace of nitrate of silver behind, which increases the sensitiveness of the bromide far more than a coating of tannin, morphine, &c. If a plate of this kind is covered with an organic body, the latter works upon the trace of silver, and decomposes it. The powerful sensitizer is also destroyed, and a weaker one takes its place; for this reason there is a decrease of sensitiveness. Other causes may also contribute to bring about the result.

It is known that a trace of organic matter does great mischief in the silver bath. A small amount of tannin or resin introduced, not only renders the solution very much less sensitive, but also produces fogging. Judging from practical experience, bromide of silver is more easily affected than iodide; under some circumstances, indeed, the bromide of silver images change to a positive. There is formed most likely upon bromide of silver plates similar decomposition products of the silver salt and the organic substance, and these may also injure the favourable action of the sensitizers. If, however, bromide of silver contains a small excess of bromide or chloride salt, this decomposition does not take place, and the favourable influence of the sensitizers is then very marked.

Of particular interest is the action of colouring matter upon bromide of silver plates. I have proved that there are pigments which, added to bromide of silver, increase the sensitiveness to light for those rays which are optically absorbed. Thus, coralline, naphthaline red, and roseine increase to a high degree the sensitiveness of a film for yellow rays, so that bromide plates coloured with these substances are quite as sensitive to yellow as they are to blue; eosin increases the sensitiveness of bromide plates for yellowish-green rays, methyl violet for orange red, &c.

Till now I believed that this action of the pigments would demonstrate itself with every kind of bromide of silver, whether this was prepared with an excess of silver salt or bromide salt. A direct experiment proved to me the contrary. A very dilute naphthaline red and cyanine solution, poured upon plates prepared in the bath, produced a high degree of sensitiveness for yellow and orange light, but was without any influence at all upon emulsion plates prepared with an excess of chloride of calcium. These plates, exposed to the action of the spectrum, showed a vigorous sensitiveness in the ultra-violet to G $\frac{2}{3}$ F, but not a trace of increased sensitiveness for yellow or orange.

It follows from this that the above named pigments act in quite a different way to the earlier known sensitizers, such as silver, tannin, &c., and it was to be expected that the favourable action of the pigments depend upon the so-called sensitizers, as, for instance, nitrate of silver. To test this, an emulsion plate was put into a silver solution, thoroughly washed, and then covered with naphthaline red. In this case the sensitiveness to yellow was shown in a most pronounced way.

Next, tannin was tried with naphthaline, and the yellow solution increased to a considerable degree the sensitiveness of the plate for the spectrum from G into the ultra-violet.

On the other hand, the sensitiveness for yellow induced by the presence of naphthaline red was only small in comparison to the sensitiveness imparted by naphthaline red in conjunction with a trace of silver salt; at the same time it was plainly perceptible.

An acetate of morphine solution (1 to 200) acted in the same manner.

The experiments, however, showed the necessity of the presence of another sensitizer when the favourable influence of the pigments upon bromide of silver is to be felt. As the best sensitizer, nitrate of silver again distinguished itself. A larger excess does not give a better result. It follows that the sensitizing action of certain light-absorbing pigments must be of a different nature to the sensitizing action of those bodies which absorb iodine and bromine. The latter act of themselves, while the former require the presence of another sensitizer of the latter kind. Sensitizers may therefore be divided into two classes: the optical, which only acts by absorbing light; and the chemical, which combine with iodine and bromine.

Postcript.

Nearly all the colours which have proved themselves optical sensitizers in my experiments are more or less sensitive to light; and it may be considered that this property is a condition of their action, so that the so-called genuine or fast colours, notwithstanding their energetic optical absorption, hardly act as sensitizers at all.

My earlier experiments have shown that the quantity of the colours employed upon the bromide film has a particular influence upon its sensitiveness. Too highly coloured films are a mistake, and some trials are necessary before the right degree of tint is secured that will furnish the best results. I have tried to overcome the difficulty by exposing the tinted films through the glass; but I have found that even in this case too much colour is injurious. I used formerly to colour the collodion itself, but as the silver bath took up some of the colouring matter, I now proceed by pouring over the plate an alcoholic colouring solution, which dries within half-an-hour, so that the plates can be employed almost immediately.

I found that a solution of naphthaline red, which was exactly as deeply tinted as a highly sensitive film for yellow prepared with naphthaline red *tinted collodion*, applied to finished plates, gave no sensitiveness for yellow, and it is only when diluted to a fifth of its former strength that any increase in sensitiveness was noted, this sensitiveness increasing to a most marked extent when further diluted to a tenth.

For this reason the colouring matter must be employed in an exceedingly dilute form compared to the coloured collodion that is used. The reason for this may be that a large portion of the colour is carried away on washing the bromide film, and another portion may be absorbed in the bath. I employ naphthaline red, by taking one drop of a saturated solution in alcohol, and dilute this with 100 cubic centimetres of alcohol.

It may happen that a substance is a chemical and optical sensitizer at the same time, and such a one would act without the presence of nitrate of silver to sensitize such rays as it absorbs. It may also happen that such substances upon plates prepared with an excess of nitrate of silver have an unfavourable action, as I have shown to be the case with gallic and pyrogallic acid, and morphine, which, instead of increasing, diminish the sensitiveness of the plate, from the circumstance that they form, with nitrate of silver, injurious decomposition products. When this is the case, the optical action of a colour is not observed either, as my experiments have shown. For this reason we must not wonder where we have colours which do not impart any further sensitiveness to a plate for those colours which they absorb. There is a well-founded hope, however, that the expected action upon bromide plates prepared with an excess of bromide salt takes place in the presence of other chemical sensitizers.

Further experiments, which require the co-operation of many to carry them out, can only furnish us with the information required. In the meantime I considered it best to publish these experiments, as they offer an explanation of many unsuccessful results that have been obtained by those working with pigments upon collodion, and because they are also of particular interest in regard to our knowledge of preservatives or sensitizers.

CORRECTING THE NITRATE BATH.

Mr. A. Buell Coe, writing to *Anthony's Bulletin*, says:—

"Some favoured operators are continually tantalizing their brethren by their how-to-do-it, which amounts to a simple letting alone of the bath and the bath will let you alone, carrying the idea that it may be worked an indefinite length of time without any change whatever, if simply used for the purpose originally designed; but we all know that a continued immersion of plates coated with a film of a character easily detached or separated in minute quantities will, if not of the precise character of the fluid, in a longer or shorter period, according to the amount of work done, change the properties of the bath to the degree of utter confusion and failure, if not corrected and purified. As I have been successful in the use of my formula, I give it, and hope it may be of benefit to some one:—

"When I detect any impurity by which the nature of my bath is changed, I make a fifty-grain solution of permanganate of potassa in distilled water, in which ten grains of cyanide of potassium have been dissolved. Drop this into the bath until a faint rose tinge appears, and then set in the light. I do not wait for sunshine, but take a rainy day for it, when I do not expect custom.

"In a very short time every particle of organic and foreign matter will be precipitated, leaving it so pure as to almost look blue; and then, if you wish to rid it of alcohol and ether, bring it to the boiling point, cool and acidify sufficiently, and I will warrant you a bath which will produce finer results than before. I am positive a bath can be worked nearer the alkaline side of neutrality with my formula than if neutralized with bicarbonate of soda or ammonia, and the advantages of such a bath—whether proceeding from the use of a collodion containing free iodine enough to liberate sufficient nitric acid in the film to prevent fog, or whether the character of the bath will admit of being worked with a neutral collodion by the addition of permanganate of potassa and cyanide—are manifold.

"I have had the bath now in use over fourteen months, in as nearly an alkaline state as possible, and in that time have never had a plate fog, and have treated it to the permanganate solution but twice. During this winter I have had more children's pictures to take than adults', and although my light is extremely small, I have failed but once in securing good negatives, attributing my success to a quick-working alkaline bath."

UPON IODIZING COLLODION.

BY DR. JOSEF MARIA EDER.*

Regarding the quantity of iodizing salts to be employed, and the best proportion of iodine to bromine for various photographic purposes, I do not now propose to speak, but shall confine myself to the consideration of the most serviceable combination of different iodine and bromine salts, and of some practical results which I have obtained in a research upon iodizing salts. It is universally known to be by no means a matter of indifference what iodizing salt are chosen, and yet no definite decision has been arrived at on the subject. It is only by having recourse to precise data and figures that the matter can be thoroughly discussed, and for this reason I have been as precise as possible in the work I have undertaken.

Before all, it is of the greatest importance that the application of potassium salts in collodion, especially in bromo-iodized collodion, should be further ventilated. Hardwich was the first to show how difficult to dissolve in collodion the bromide of cadmium is, and he warns us, therefore, from employing iodide of potassium in bromo-iodized collodion, because it forms, with other bromine salts, the bromide of potassium, which separates, because of its difficulty to dissolve in a crystalline form. In my previous experiments upon the solubility of these salts it was proved that (provided cadmium salts are not present) collodion made up with equal parts of alcohol and ether is in a position to dissolve only 0·06 per cent. of bromide of potassium, an amount which is quite useless from a photographic point of view, if it is sought to make up the bromine salts required in bromo-iodized collodion with bromide of potassium alone. The solubility does not increase when iodide of potassium or iodide of ammonium is added to the collodion; it is, however, materially increased by iodide of cadmium, or bromide of cadmium, in which case no double salt is formed; but, on the contrary, the bromide of potassium-cadmium, if put into collodion, is decomposed into bromide of potassium (which separates) and into a soluble bromide of cadmium. Some solubility experiments showed that alcohol-ether (equal volumes), which contained five per cent. of iodide of cadmium, dissolved about two per cent. of bromide of potassium, and a five per cent. solution of bromide of cadmium in alcohol-ether gave an almost similar solvent.

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* Read before the Photographic Society of Vienna.

Neither does iodide of potassium alone suffice to iodise a collodion as strong as is often desirable, for ordinary collodion (equal volumes of ether and alcohol) will only dissolve 0·9 per cent. of this salt. The solubility of iodide of potassium is raised to an extraordinary degree (about five times) by the presence of iodide of cadmium, and, in this case, the cadmium acts not only in a physical manner, if I may so express myself, but there is formed a soluble double salt of which the collodion is in a condition to dissolve as much as twenty per cent.; the iodide of potassium-cadmium, therefore, is very suitable by reason of its easy solubility for the production of iodised collodion, but cannot be recommended for those in which bromine salts are required, for as soon as the latter are added bromide of potassium is formed, the solution of which is so difficult.

Notwithstanding these unfavourable premises, Captain von Toth and myself prepared a collodion which contained iodide and bromide of potassium-cadmium. It had the following composition:—

Absolute alcohol	50 cub. cents.
Double iodide of potassium-cadmium	2·24 grammes
Simple bromide of potassium-cadmium	0·37 ,,

A portion of the bromide of potassium separated after twenty-four hours, and the remaining fluid was filtered and added to three times its volume of collodion. Another collodion was treated with:—

Alcohol	50 cub. cents.
Iodide of potassum-cadmium	2·24 grammes
Simple bromide of ammo-mium-cadmium ...	03·4 ,,

In this case also a good deal of bromide of potassium was separated.

These collodions, like all other in which potassium salts occur in notable quantities, are less durable than the ammonium cadmium collodions to be hereafter described, and do not yield such fine pictures, a matter to be explained by the greater evaporation of the ether and alcohol, and the separation of a portion of the bromide of potassium, and the consequently coarser character of the bromide film. Small quantities of bromide of potassium are not injurious (in fact, there are many well-working collodions produced by means of potassium salts), but they are not necessary, and the absence of them in collodion is to be recommended.

As regards sodium double-salts, I have occupied myself little about them, as their preparation in a pure state from impure sodium salts presents many difficulties. Toth and I essayed an ordinary collodion treated with bromide and iodide of sodium-cadmium; it worked very well, and was almost as sensitive as the hereinafter-mentioned ammonium-cadmium collodions, but had no advantages over these. It was rather less durable, and was of a limpid character.

Particularly good qualities are to be found in the ammonium-cadmium double salts, which not only possess a very great tendency to crystallize, and, therefore, are easy to produce in a pure form, but are, moreover, particularly stable. The simple bromide of ammonium-cadmium is quite stable, and does not decompose like bromide of cadmium, and is not hygroscopic like the bromide of sodium. The double iodide of ammonium-cadmium enjoys exactly the same properties, for it is also very stable, and would certainly, if it were to be had in commerce, be preferred to iodide of ammonium, which becomes red after a short time, so that a collodion iodized by its means loses some of its sensitiveness after a time.

It now becomes a question which is the better of the two, the simple or the double iodide of ammonium-cadmium. Experiments made to determine this with collodions sensitized respectively with the simple iodide of ammonium-cadmium and simple bromide of ammonium-cadmium on the one hand, and with double iodide of ammonium-cadmium and the double bromide salts, applied in equal proportions, showed that the first collodion was not very durable, and that it was colourless to begin with, and only became yellow after a long time; while the second gave a much more sensitive compound, which, several hours after iodizing, showed a slightly yellowish tint, which, however, never gets more marked, even after the lapse of a considerable period. That prepared with the simple salts was a thicker collodion than the normal collodion that was originally mixed with it, while the double salts seem to have had no influence upon the consistence of the normal collodion at all. Upon these grounds, and supported by the results of many parallel experiments, we have decided upon placing the double iodide of ammonium-cadmium in the foreground, and to recommend it as the most suitable of all iodizing salts for admixture with collodion.

(To be Continued.)

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A WHISPER TO COUNTRY ARTISTS.

BY COSMOS.*

Any decline in business, when your superior work cannot possibly be the cause, must be traced to your interior management. The treatment of customers, and their disappointment in not getting their pictures after one or more promises, will produce an ill-feeling which will spread amongst their friends with an aversion to your place. If you feel perfectly free from feeling like *mea culpa, mea maxima culpa*—in these two points, then, and only then, you may console yourself with the idea that "business is dull everywhere;" if not, meditate on the following illustration of the two causes above.

1. *The Treatment of Customers.*—(Politeness to all is, of course, understood). The business being once well established as to the style of work, and the price therefore &c., no preference must be given to any person as regards social rank, personal charms, friendship, &c.; nothing but actual present engagement or appointment ought to prevent the business man from attending to the applicant, whoever and whatever he or she is, promptly and fully to the aim and end of his business. To let go or send off a caller of seeming inferior appearance (so often very deceptive) on some pretext may, for aught you know, be the mysterious reason for your neighbour's increase of business and the decline of your own.

2. *Disappointment after Promises.*—Customers who are capable of appreciating the superiority of your work are generally also capable of judging how many "clear days" it will take to finish their pictures, and they will not call for them before allowing you plenty of time. This is one class. The other class (and by far the most common in country business) care, not so much about your "first-class work only," as for getting their pictures just when you promised them; they will pay you just the same as the other class, and gladly, if you are ready with the pictures at their call, and thank you besides, for your obliging promptness. But when the customer comes in, and you say "No, not yet; I am sorry; the bad weather, you know," &c., he or she will recollect the weather, and say, "Well; I will come again; the weather was not so very bad;" but if, on the second or third call, no pictures come forward yet, you may

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* *Anthony's Bulletin.*

fairly expect to be told, or get a note to the effect, that they don't care for the pictures, but will go somewhere else, where they can get them sooner, if not better.

When that disappointed customer is gone, you will feel neither good nor bad. You can feel good only when natural or true causes prevented your keeping the promise. You will feel bad when your own neglect or procrastination caused the disappointment, and then you will try to smother your conscience by cursing "that impatient fool." And now again you have lost, for aught you know, not only this customer, but all his or her hosts of friends, whom you might have secured by promptness, impartiality, and politeness—the great virtues and secrets of success in business.

CYANIDE OF POTASSIUM AS A POISON.

BY DR. B. W. RICHARDSON, F.R.S.*

Serious symptoms are sometimes produced by the absorption of cyanide of potassium in those who are engaged at work where solutions of this substance are employed. The danger affects specially those who are engaged in photography. It seems to me to arise by direct absorption of the poison by the skin, but only when the skin is wounded, abraded, or chapped. My attention was first called to this subject by a photographer, who consulted me for a series of symptoms with which I was not familiar, and which could not be accounted for by any evidence leading to the suspicion of organic nervous disease. The symptoms came on only when he was at his work, but they lasted for some hours after he had left his work. I suspected they might be due to the inhaling of the vapours which are present in the working room of the photographer; but this theory was excluded by the fact that he had worked many years in the same place without being affected in the same way, and that none of the workmen who were with him in the same room were similarly affected.

These circumstances led me to look out for local absorption, and I found on inquiry that the hands of the man were severely chapped, and that they were so on every occasion when the phenomena recurred; for the phenomena were repeated many times before their cause was discovered. We were now on the right track, and by his giving up that part of the employment which involved exposure of his chapped hands to the solution, the patient experienced a quick cessation of his symptoms, and recovery from them without their recurrence.

The symptoms are exceedingly characteristic; they begin with vertigo. A sense of giddiness is gradually developed, with a sensation as if all objects, were passing in a circle, and then as if the body of the affected himself were turning round. At times there is a further sensation of falling, as though, of necessity, the body must pitch forward, and as if the lower limbs were unable to support the weight of the body. These symptoms may last for some hours, and if they are not exceedingly severe they will subside when the work of the day is over, and will not recur until the resumption of labour on the following day. They may be entirely misunderstood, and, indeed, often are misunderstood. They are attributed to biliousness, or to indigestion, in their lighter manifestations. When they become more severe another symptom is added, the giddiness or vertigo is attended with nausea and faintness, so that it is impossible to go on with the work. But even from this more extreme condition recovery is rapid after exposure to the cause ceases.

Under still further exposure the body becomes cold, and an extreme shivering takes place, which is succeeded by a prostration that altogether incapacitates from work, and is connected with a series of new nervous phenomena of great moment. The first of these nervous signs is double vision; the patient, that is to say, in looking at a single object, sees it as if it were two objects, or as if both eyes were separately discerning the one thing. Finally, there are muscular tremors, which are altogether beyond the control of the will. The tremors do not amount to spasms of the muscles, but they are sufficiently active to cause involuntary movements of the limbs, and they are attended with occasional starts and twitchings. The temperature of the body is lowered, and the appetite is greatly reduced; the secretions are confined, the face pale, the action of the heart quick, weak, and irregular, and the sense of exhaustion urgent. The mind throughout is unaffected, but there is, perhaps, an unnatural tendency to sleep.

The poison being soluble finds its way out of the system with moderate rapidity, and thereupon all the severer symptoms are removed, but some remain for several weeks. The strength returns but slowly; dyspepsia continues as a very troublesome symptom; anæmia is a marked condition, and the blood, which has been rendered very fluid, escapes too freely from wounded surfaces.

Some examples of poisoning by the local absorption of cyanide of potassium have been recorded, in which symptoms still more alarming than any I have seen have followed upon the accident. One remarkable case of this kind is given by Dr. Davaune. A gentleman who had stained his hand with nitrate of silver endeavoured to remove the stain by rubbing it very freely with cyanide of potassium. In this process he slid under the nail of one of his fingers a small portion of the cyanide salt. At first he did not notice what had happened; but in a little time he felt a severe pain in the part, which, after a few minutes, was followed by an intense vertigo, so that all objects appeared to be moving around him. To relieve himself promptly he conceived the idea of washing the part freely with vinegar. The vertigo now increased, was accompanied by shiverings, extreme pallor, complete loss of sight, and entire prostration; even the power of speech was lost, but the intelligence was throughout preserved. The limbs were very cold, and as the sight returned, the phenomena of double vision were manifested. These alarming symptoms were not altogether removed within a period of ten hours; but perfect recovery ultimately took plate.

Davaune assumes that in this instance the symptoms were intensified by the application of the vinegar. He believes that by the use of the vinegar the cyanide salt was decomposed; that hydrocyanic acid was thereby directly produced, and that on the absorption of this poison, the symptoms were so actively developed. It is worthy of remark, however, that the symptoms appeared before the acid was applied, and might therefore have been due to the direct absorption of the salt. The changes which the salt undergoes in the presence of the animal secretions, and in its course through the body, have not as yet been discovered. It is known, however, that the iodide of potassium salt is decomposed within the body, and the probabilities are strong that the cyanide is also decomposed, and that the symptoms are due either to cyanogen, or, as Davanne supposes, to hydrocyanic acid.

While on this topic I may with advantage offer a word of precaution respecting a practice which is commonly adopted by gentlemne who are engaged in photographic pursuits, and which had better be avoided. It is customary for the photographer, when his hands are deeply stained with nitrate of silver, to clean them of the stain by using cyanide of potassium. The process effectually removes the stain, but it is always attended with some risk, and when there are any sores or wounds on the hand, the risk becomes actually dangerous. It is best, therefore, to use some other potassium salt than the cyanide, for the purpose named.

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* Continued from page 255.

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BROMIDES IN ALBUMENIZED PAPER.

It is one of the common sources of disappointment to experimentalizers to find, after spending much time, material, and patience, and often no little ingenuity, that their labours in the especial line selected have been anticipated, and the results, successful or the contrary, duly chronicled by some former worker. The young experimentalist has made the blunder of not studying what had been published on the subject before commencing his experiments. In some cases the facts are similar without the same blame. An enthusiastic young experimentalist discovers something which is to him entirely novel, and probably useful. He searches, and finds no record; but when he mentions his discovery to experienced men he finds the idea familiar as one long since tested and found wanting. The use of bromides in direct printing is one of these novelties which are almost as old as photography; alone and in combination with chlorides it was one of the earliest silver salts tried. Allusions to its use in this way are scattered throughout almost all historic photographic literature. But although suggestions for its use still spring up from time as a novelty of importance, it has never come into general use.

Our attention is drawn to the subject again by a discussion at the Photographic Section of the American Institute, in the course of which the fact was mentioned that the use of bromides in albumenized paper was no novelty amongst some photographers in the United States. So far as experiments of our own, made many years ago, suggest, bromides are never likely to play any important part in direct printing, even were silver printing likely to remain in vogue in perpetuity. Bromide of silver, like chloride of silver, rapidly darkens under the action of light. Like the chloride, bromide, in the absence of free nitrate, never assumes a very deep tint, not reaching any deeper colour than lavender; but, unlike the chloride, it does not, even when free nitrate or an organic salt of silver is present, acquire depth and intensity sufficient to give it value for printing purposes. A print produced on plain paper salted with a bromide, and sensitized in the usual way, is soft and harmonious, but weak and grey. Albumenized paper salted with a bromide, gives a print of a little more brilliancy, but still lacking depth of colour and force. A mixture of bromide and chloride has the advantage of yielding very harmonious prints from hard negatives; but with good negatives there is a loss of force proportioned to the bromide present. In the rare cases where dense hard negatives are employed, it is clear, then, a bromide in the albumenized paper might prove advantageous. But as a similar end may be obtained by washing the free silver partially from ordinary albumenized paper, and to some extent by printing in full sunlight, the more troublesome process of employing a paper specially salted with bromide is scarcely likely to come into general use. There is one advantage alleged on behalf of the bromide which we have not ourselves tested, but which, if it exist, might in some cases be worthy of consideration, namely, the greater sensitiveness of the paper salted with it. But this, except in case of a large number of prints being required from very dense negatives, would scarcely be a consideration.

Whilst referring to the repetition of old experiments in printing, we may take occasion to express a conviction that there is still an extensive and interesting field open for investigation in the cyanotype processes of Sir John Herschel, and in the uranium processes. In connection with the latter we may recall an experiment we published some years ago, in which, with a solution containing only five grains of a double salt of silver and uranium, we obtained vigorous prints with short exposure, requiring only soaking in water for fixation. Regarding the use of bromides we quote the discussion in New York, to which we have referred:—

"The President said that, in reference to the use of bromide in albumen for making prints, it appears to be a matter of considerable importance in Europe. The journals there publish much of what is said and written in regard to its effects. Now this is a very old thing. Mr. Anthony knows this, as some years ago he took a trip with me to the Alleghany Mountains, where we made a large number of exposures on dry plates in printing, from which we tried a number of experiments. The ordinary albumen paper would not make such pictures as we would wish, so I got Mr. Hovey to make for me some paper more suitable for the work. I went entirely through the whole series of chlorides and bromides, excessive bromide and excessive chloride, with variations. These experiments I stated to the Photographic Section at the time. With the paper of Mr. Hovey, I used only one grain of bromide of ammonium and six of the chloride of ammonium to the ounce of albumen. He merely mentioned this as it is now becoming a prominent matter, and even brought forward as something new and important. The paper gives all the details as to preparation.

"Mr. Chapman remarked that it was shown from the remarks of the President how necessary it is that every practical idea and experiment should be published at the time. Experiments that we have tried long ago, we see every now and then published as something new and original. We have now every facility for making our experiments and discoveries known and recorded. At our meetings we have reporters present, and the photographic journals are open to us to set forth anything new and remarkable. Any little matter tending to improve the art should be published; and all experiments should be carefully recorded in our minutes, so that anything mentioned at our meetings could be referred to at any time.

"Mr. Anthony said that when the President mentioned to him the use of the bromide he tried it, and found that its effect was similar to that of washing the excess of nitrate of silver from the paper. The printing in the dark parts would proceed to a certain degree of depth, and a longer exposure to the action of the light would produce no more effect in them, but would allow the printing to go on through the dense part of the negative, so that a soft harmonious print could be produced from a hard negative.

"The President stated that the proportions to be used of the bromide were marked on the paper Mr. Hovey made for him. But a trace, say one grain of the bromide of ammonium to six of the chloride of ammonium, could be used with advantage."

SILICIOUS EARTH, AN EXCELLENT MATERIAL FOR CLEANING PLATES, VESSELS, ETC.

Writing in the *Mittheilungen* on this subject, Herr W. Grüne remarks, that as well polished plates and clean utensils are of the highest importance in successful photography, it is useful to have a thoroughly good means of providing these, and silicious earth he can particularly recommend for the purpose.

The silicious earth, which is found in nature near Lüneburg, consists of microscopically small scales and scale fragments of infusoria composed of pure silicic acid, and forms a light, porous, imperishable, and infusible mealy mass, which at an ordinary temperature is not attacked by most chemicals. The silicious earth is obtained in commerce in a levigated condition, and when moistened with water constitutes a capital medium for polishing plates, so that even greasy surfaces are put into a serviceable condition very quickly without undergoing any elaborate washing process.

The action of the material is due partly to the fine state of division in which it is, and also to the extraordinarily great absorbing power of the infusorial matter; the latter absorbs more than double its weight of fluid without getting liquid, and thus it is possible to mix it with all sorts of solutions, acids, alkalies, &c., and to use the properties of these without any risk of the liquids being thrown about. It forms, indeed, a safe medium for the employment of these somewhat dangerous agents, as also an economical one.

To employ silicious earth in this manner, it is simply necessary to mix the liquid, whatever it may be—nitric acid, ammonia, alcohol, &c.—with the powder, until this is saturated with it; the circumstance that the earth is without action upon most chemicals is a great advantage, as when it enters by accident into a bath or a solution of any kind, it exert no injurious influence whatever.

For the purpose of cleaning porcelain dishes, glasses, and bottles, it is generally sufficient to rub or shake up moistened earth in contact with the surface; but to remove grease, or resin, gums, &c., the earth is mixed with alcohol, benzole, ether, &c.

The great volume and the cheap price of this silicious earth also renders it a capital agent for strewing about where liquids are likely to be spilt, as it readily absorbs any solutions that may fall upon it, rendering their action at once void. A store of it in the laboratory or workroom is, moreover, convenient for throwing down on the occasion of any accident, to absorb any liquid that may escape from a broken utensil, thus confining the damage to very narrow limits. Its action in this respect is far superior to that of filter paper.

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COLLODION POSITIVES ON EMULSION PLATES

At the last meeting of the Photographic Section of the American Institute, as reported in *Anthony's Bulletin*, Dr. Miller stated that by a peculiar mode of developing he found that it was possible to make a very fair positive, what may be called an ambrotype, on an emulsion plate, using the alkaline developer, and adding the carbonate of ammonia and a very small amount of pyrogallic acid. The image, after being fixed, has a white creamy colour. What the exact proportions were for producing this effect he had not yet determined. He brought some of the plates with him for inspection. He would state, however, that in making an ambrotype by the emulsion process, the most of the development is produced by the alkali. The pyrogallic acid is in very small proportions; some of his solutions had contained as little as the one-fourth of a grain to the ounce, but the ammonia had been very strong. These specimens possess no particular merits as ambrotypes, but they merely show what can be done.

Mr. Anthony said he had recently occasion to make some pictures in a patent case, in which an old-fashioned plate-holder had a matt or cardboard diaphragm, which would be injured by using a wet collodion plate in it. It was necessary to produce a picture by means of this apparatus, and the construction of it was such that it became necessary to use a ferrotype plate to fit the picture on; consequently a ferrotype plate coated with bromide emulsion was used, and after exposure developed, a very fine positive picture being produced.

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FRENCH CORRESPONDENCE.

Crookes' Radiometer—Micro-Photography in Spain—Leon Vidal's Improvements in Mechanical Printing—Errors in the Depiction of Luminous Objects.

The monthly meeting of the French Photographic Society was held last Friday, the 2nd inst.; there were signs to be observed of the approaching summer; but fifteen members put in an appearance in reply to the Secretary's invitation. The programme, therefore, was a very short one, although an interesting presentation was made to the Society in the form of a radiometer constructed upon Mr. Crookes' method. This was the first occasion upon which an instrument of the kind had been publicly exhibited in France, and it was with deep interest that the members examined the tiny instrument. The readers of the Photographic News are certainly more advanced than we are, and they already know this curious apparatus, whose theory and application are not yet perfectly defined. They are aware that it consists of a little glass globe, of a pear-shape form, hermetically sealed (after the interior has been rendered a vacuum), in which is suspended a little wheel composed of two cross bars, at the extremity of which are discs of metal. One side of these discs is brilliant, and the other matt and dark. When the apparatus is exposed to rays of light, whether natural or artificial, the little mill or wheel gets into motion, and turns more quickly, the more powerful are the rays that impinge upon the instrument. At first, it was believed that the apparatus represented an excellent method of measuring the intensity of light, but it has been found that heat also has its action, and we had a proof of this the other night. The warmth of the hand sufficed to put the mill in action in the dark, many members taking note of the circumstance. But, in any case, the tiny apparatus caused the liveliest interest among those present.

A remarkable collection of micro-photographs was passed round for the inspection of the members, the work of a Spanish photographer, M. Truan, of Gijon, of whom I have already had occasion to speak in these columns. Several pictures obtained by the greasy ink method of M. Scamoni, whose process is employed upon a large scale in Russian government establishments, were also examined with interest.

Recently, M. Leon Vidal made known an improvement which he has just made in printing with greasy ink upon bichromated gelatine. Those who make use of this kind of printing method employ exposed plates without troubling themselves about modifying any part of them; so that they are obliged, if the image lacks the necessary margin, to cover it in a second operation. It is the same if they desire to add to the impression a signature or description of any kind. Neither can they help themselves when it is necessary to retouch the subject in those parts which fail or have defects. M. Vidal has been able to effect an improvement in printing with greasy ink by covering the image with a substance combining the property of rendering the gelatine insoluble, just in the same way as light acts upon an organic matter when this is mixed with a salt of chromium. Tannin is capable of doing this, and an ink containing very slight proportions of this substance allows one to trace upon the gelatine, after light has formed an image, and after washing in water, any writing or characters that may be desirable. The surface of the plate being very highly polished, it is possible to execute upon it the most delicate designs, and to trace the finest lines, or add, indeed, anything that may be wanting in the image formed by light. You may also, by employing a thin ink containing tannin, obtain any typographic transport, just in the same way as when working upon a lithographic stone with greasy ink. There are a great many ways in which this method of being able to supplement the image will be useful, and any one may utilise it according to his wants. It would be superfluous to indicate all applications that might be made by means of this process, but in many cases one would be in a position to do away with the lithographic stone altogether.

To resume: the process permits one to derive simultaneously from a gelatine surface all the advantages which a lithographic stone can furnish when manipulated by pen or crayon, together with those of a bichromate impression produced under a negative. The ordinary ink employed for lithographic purposes answers very well, but M. Vidal prefers to make a solution of gallic or tannic acid more or less concentrated, according as it is desired to secure tints of a greater or less intensity. It is possible to produce black or grey proofs at will.

In terminating his communication, M. Vidal has promised to present the Society, at an early date, with a proof representing letterpress and sketches at the same time, such as may be seen in our illustrated journals; the printing of which shall be done at one operation, and at the rate of twenty-five per minute.

M. Angot has communicated to the Academy of Sciences the results of a very important research bearing upon the images taken of the Transit of Venus, and also having a general interest besides. It has been remarked for some time past that the photographic image of an illuminated object is found to be dilated, the lighter parts overlapping the darker portions. The result is an error which it is indispensable should be determined, so that it may be corrected in the delicate calculations which have to be made from the images of the Sun and Venus. It is this which M. Angot has essayed to do. The method which he employed consisted in taking, under various circumstances, the photographic image of a source of light formed by two rectangles separated by an interval of darkness. The augmentations in the dimension of each luminous rectangle is equal to the diminution of the dark space which separates them. The total of the two quantities should be constant, and its verification gives the degree of approximation of each experiment. The main thing resulting from the work of M. Angot is that the dimensions of the image increase notably when you augment either the duration of the pose, or the intensity of the light. The phenomenon is absolutely the same when operating upon dry or wet collodion, or if the intensity of the light is varied, and the exposure remains the same. M. Angot ascribes the phenomenon purely to physical causes, and hopes to give further explanation of its formation, in a little while.

Ernest Lacan.

SOME PRACTICAL HINTS ON CARBON PRINTING.

BY F. BAUM.

The Exposure—Photometers.

This will be a bugbear to beginners, especially so to silver printers, to whom the idea of not being able to watch the progress of the printing will be quite revolutionary. It is really very important, especially if the prints are small, and intended to be developed several on one plate. The great thing is to get a reliable actinometer or photometer, and none of those in ordinary use appear to me to answer the purpose very well. They are of two kinds. The ordinary actinometer, sold by the Autotype Company, and I believe used by them, is too well known to need description. The difficulty with this is, that it is very difficult to get the exact tint, and having to give three or four to each exposure, a slight variation as often as that will make a great difference in the result. Then there is Lambert's photometer, a great improvement in that respect, but radically wrong in principle. A piece of tracing paper is numbered from 1 to 8, No. 1 having two thicknesses of tracing paper, No. 2 five, No. 3 eight, and so on; and a piece of sensitized silver paper of a certain strength is put on and exposed with the negatives. The first number will soon appear, the second shortly after, and at the appearance of the third the thin negatives will be sufficiently exposed, the denser ones taking proportionately longer—perhaps till six or seven. If the light were always of one quality this photometer would do very well; it is evident, though, that a varying strength of light will penetrate differently through a negative to what it will through tracing or other paper—every printer knows that. Another objection is, that however careful you may be to put in your sensitized paper while it is dry, the dampness of the atmosphere will inevitably cause it to leave some of the silver on the paper composing the photometer, and so causing it to become denser every time a fresh piece of paper is exposed under it, and when it is considered that it will be filled in fresh at least a dozen times daily while fine, it will be seen that it will soon become useless. When I first tried it, I found an average negative required the number four to appear to be properly exposed; after a fortnight's use it was sufficient for the number one to appear for the same negative to be sufficiently exposed, with the strongest indications that soon something less than nothing would be required.

This made me think of trying to produce something more reliable, and bearing in mind that, to be perfect, the light must travel through the same medium in the case of the tissue to be exposed as in the meter to guide the exposure, I soon hit upon what I have found a most useful and certain photometer. Not anticipating any great success in trying to produce negatives composed of different thickness of tracing paper, I thought the best way would be to make a negative of meter in the ordinary way. This is done by writing with a brush, in black varnish, on a strip of white cardboard, Nos. 1 to 10 under one another. Take a quarter-plate, sensitize, and stop down your lens so that it would take forty seconds to take a sitter; focus the numbers, and expose. Let No. 10 have three seconds, and cover it during the rest of the exposure with a piece of white cardboard; No. 9 has six seconds, and is covered in the same way; and so on, giving No. 1 thirty-two seconds, and covering the whole with the white cardboard during the rest of the exposure. Develop, and you have a negative of a meter that will never fail you. Since using this for three months, I have had no case of wrong exposure, except arising from carelessness or mistaken judgment in printing the first copy from a negative. With a little care in making and testing it to suit yourself, it will be found practically perfect. A theoretically perfect one would be for the light to travel not only through the same medium, but to affect the same—*i.e.*, a film of bichromated gelatine. This can be done, as a paper coated with gelatine, and sensitized in the same bath as the tissue, will show the picture before development, but only by a slight change in colour where the light has most affected it, and, therefore, not practically useful.

Considerable allowance must be made for the temperature at which the printing is done; on cold, dry days the tissue is not nearly as sensitive as when the weather is damp, rendering the tissue limp. I much prefer working it in the latter state. and have never had a piece stick to a negative; but a muslin bag containing fresh chalk powdered rubbed lightly over the negative, will be found an excellent and a certain preservative. It must be borne in mind that a margin is absolutely necessary to each print except vignettes and medallions, such as have to be tinted by double printing. The safe edge is quite as good, or even better, slightly tinted (as would be the case with an oval tinted round) than pure white, for if a very dark spot should happen to be cut off by the oval, there would be great danger when the edge, being white, was quite dissolved, of the picture going off the support through having been printed so much at that particular spot as to refuse to adhere; whereas if the edge were slightly tinted it would hold, and render the operation safer. If it is desired to print a plain picture, paste round the side of the negative about a quarter of an inch of black or yellow paper, and cut the tissue the size of the glass.

Should a border be wanted to the picture, nothing would be better, perhaps, than the Lambert's printing-frame (patent, I believe). If these are objected to on the score of exposure, a little trouble at first in making ordinary printing-frames self-registering will answer quite as well. The masks to be used should have the top and left edge distant exactly one like the other from the aperture, and should be fixed with gum to the frame, but only at the bottom and right edge, which may be any size. The negative (premising that the frame must have a glass, and be larger than the negative to allow of the latter being moved to its proper position, as the mask is stationary) should be put between the glass and the mask, and fixed in its proper place. The tissue must now be pushed close up to the left-hand and top edges, and marked at the top left corner. To prepare the tinters, get an ordinary printing-frame, cut the disk rather smaller than the mask, fit the latter temporarily in the frame, and fix your disk outside the glass; remove your mask, and put your piece of tissue that has been exposed under the negative in the tinter, taking care always to push the top and left sides against the frame as in the printing, and your register will be perfect, and will not show any hard white line on either side.

ON THE ACTION OF THE BLUE, YELLOW, AND RED RAYS UPON THE PHOTO-SENSITIVE SURFACE.

BY THOMAS SIMS.

There were, I believe, some plates kept in a dark case in the Great Exhibition of 1851, which were said to be Daguerreotyped impressions having natural colours; but those who told me they saw them could give but very uncertain descriptions of what they saw. About the same time letters came to hand from the United States of America which announced that a Mr. Hill had made the discovery of making impressions of nature in colours by the Daguerreotype process. "Wait until next mail," said our correspondent; "there is some hitch in the fixation which will by that time be overcome." The same reports now reach us from Lyons, and now are re-echoed from Iowa.

It is true that experimental science is so intimately associated with the invisible and imponderable that few persons who think seriously would feel inclined in a hurried manner to exclude, in positive terms, this or that assumed achievement from the category of the possible. There is, however, for practical purposes this safeguard ready to hand—what has been done can be done again. Ideas may be couched in fine logical form, and apparently so consistent with natural order and law, that as far as literature is concerned nothing is left to be desired, and the fictitious inventor is sometimes crowned with a real inventor's laurels, and, as far as the merit of fine writing goes, this is well; but if any one would like to realise the difference between the two kinds of invention, let him try his hand at manufacturing the late Lord Lytton's automaton servants to do the same work by his description of it and them in "The coming race."

Theories go smoothly enough if nature is not asked her consent or affirmation by experiment; the road then becomes somewhat straight and thorny, or leads to so many by-paths that the difficulty is how to find the clue that leads through the labyrinth. This latter seems the present state of the relation between photography and light and colour. Several papers and letters recently published in your interesting journal upon this subject have had the effect of inducing me to "try back," to use a sporting phrase, but in doing so I am confronted with the accumulation of facts recorded upon this one specific subject. The necessity there is to treasure them for the sake of the arts and sciences, and in some concise and tabulated form like a dictionary, to be glanced through in a short time, and supplemented every year.

In the retrospective journey, I stop half way at the Daguerreotype process. For a camera a long box, shut in on all sides except that next the sitter; there was a large hole there, but no lens; a speculum was placed where the plate is usually now, at the back, and the focus was taken in much the same way as if a modern operator were to peep through his lens. His plate was placed towards the front or the side next the sitter. The fact is that the resemblances and differences of the ancient and modern modes, if properly worked up, would form a very humourous passage, but this is not my reason for introducing the description. It is the use of the speculum, by which chromatic aberration was avoided, and thus for comparative data, and in photographing rays already separated, the mode ought not to be overlooked. It must be remembered also that at this early date it was impossible not to see the curious propensities of the red and yellow and violet rays, and that some of the most scientific men then living aided experimenters by their suggestions in the investigation of them. That Daguerreotypists worked hard at experiments upon the solar spectrum, both to ascertain a knowledge of light and its effects upon simple and compound sensitizers, and to find which would yield best a sequential gradation in black and white, of the red, yellow, or violet rays, and then, as now, the red and yellow could only be photographed at the expense of the violet rays, or by chemical preparations adapted to receive heat rays. Modifications in the working and in the effect by the application of heat; galvanic and electric currents, with more or less success, and with these in conjunction with modifications in the chemical department, definite results were obtained, because the experimenter had to deal with less compound elements; and although the balance of conditions and proportions was so exquisitely precise, they could be with comparative ease repeated.

Having gone over again the same or analogous experiments in the collodion as the Daguerreotype, I believe that the resulting data are more expressive and definite in the latter, and in cases where decisive test experiments for scientific purposes are required, it has many advantages. Before I proceed further, I must assume that it will be granted by those who have made the subject their study, that, for the purpose of testing the comparative value of sensitizers to primary colours, the first division of the solar rays by one prism is as effective as the spectroscope, for the immediate question under consideration is the adaptability of the homogeneous preparation to the varied powers of the spectrum, to register their relative and comparative force on one preparation, because any other mode—like that, for instance, of making separate preparations adapted to receive each power, which has been tried—becomes dyeing or painting, and that under extreme difficulties, demanding from the artist the highest qualities as an analytical chemist, which would be entirely wasted if the same person did not possess the highest artistic knowledge also.

Red, yellow, and blue, whether direct from the sun or reflected from nature or painting, represent to the photographic processes heat, light, and electricity; and albeit probably only opposite poles of the same force, for that very reason they act as antagonistic elements to any homogeneous preparation, and all I have been able to read, do, or observe, has only tended to confirm the conviction that a sensitive surface of one kind—say, to the blue and violet end of the spectrum—cannot at the same time be sensitive to the red and yellow in an equal degree, and *vice versa*. The real question, therefore, is, can a homogeneous surface be prepared so molecularly plastic as to be induced to vary its ultimate atomic form to suit the refrangibility of the varied colours, and to do so within practical limits with regard to time, and strong enough to bear fixation?

Like all else in nature, it is true that the lines of separation indicated in the above remarks are neither hard nor sharp, when the facts generally known are looked at as a whole. There are a great many gradations; here and there they are hard and sharp, and here and there lost under modifying conditions. Thus, small proportions of alloy—probably lead and copper in the first Daguerreotype plates, and salts of lead in the silver solution for early paper work—rendered the respective surfaces very sensitive to heat rays, and the difficulty in working was extreme. For the Daguerreotype neither yellow glass nor artificial light could be trusted in the room, and when the operator worked in total darkness, when the plate was exhibited the image was flat, and whenever any attempts have been made by me to equalize the sensitiveness of the chemical surface in Daguerreotype, paper, or collodion, the resulting gradations have been as false, for want of contrast, as the ordinary mode is often deficient in gradation in the rendering of yellow and red.

Practically, the coadjustment of the ordinary preparations to the violet rays are as perfect in good hands as they are likely to be; it is known on one side that some red and yellow colours hold violet rays in such a way as to make them invisible to the eye, which are actinic to the photo-chemical surface; and other substances without colours do much the same thing—as, for example, quinine and stramonium—make the dark violet more visible to the eye by absorbing a portion, for the actinic power on the photo chemical surface is in the same proportion less. Other red and yellow colours have a power not indicated to the human eye, generally speaking, if at all, appear to have not only a neutral effect upon the violet rays, but seem actively to subtract the actinic influence. In other words, some reds and yellows are not only passive or neutral to the sensitive coat, but are active in absorbing all the diffused violet rays intervening between themselves and the sensitized plate, and, both in the positive collodion impression and Daguerreotype impression, such results are indicated by portions which should represent half-tone gradation, but seem blacker than if merely not acted upon. Fortunately for photography, those colours are seldom used in modern art, and as seldom seen in nature, but in modified form, so that modifications in the chemical surface to meet them make photographic gradation far superior to anything that would be predicated from the arbitrary outside facts. It is the knowledge of these correlations that will always constitute the difference between operators *and* operators.

(*To be continued.*)

PRELIMINARY COATINGS FOR GLASS PLATES.

The use of powdered mica and other preliminary coatings was discussed at the last meeting of the Photographic Section of the American Institute. Dr. Miller inquired if the talc spoken of at our meetings is generally used as a substratum. There are occasions when we can use the wet emulsion plates with advantage. Now if the plate is clean, and there is no substratum used, the emulsion (some particularly) will wash off. There are quite a number who use talc or French chalk to remedy this. It is found that the film adheres very closely to the plate by simply rubbing the talc over the plate and polishing it so as to leave a very moderate quantity on the plate. It is very annoying to have the film wash off and go down the sink.

The President remarked that the use of the talc was first published in the European journals, and Mr. Bierstadt here was the first to use it. Sometimes the albumen will hold to the plate well enough, but he found that the use of talc always produced certain results. The film would adhere to the plate very closely, and the talc obviated the slipping better than anything he had heard of or used. It is preferable to the wet substratums like gelatine solutions—which if you are not very careful not to have any floating dust around, and such dust in particular as floats in a photographic room, will cause little spots to make their appearance when you begin to develop—as, when talc is used, the plate can be dusted off before the collodion is put on. Those who are not familiar with its use will be surprised upon seeing how well it works. The fraction of a grain seems to be sufficient.

Mr. Anthony said that this substance was not soluble in water, and does not contaminate the bath in the least.

Mr. Gardner remarked that one reason why albumen had been used by practical photographers is, that it saves time and labour. They simply place their plates in water, and while they are still wet the albumen is flowed over them, and they are then allowed to dry. This is done in about one-third of the time that would be occupied if the plates were washed and dried. There is no doubt that they will never abandon this mode of treating their plates, unless they can find the French chalk to answer the same purpose. The usual method saves labour, as they do not have to clean their plates.

Mr. Chapman remarked that, with this method spoken of by Mr. Gardner, the saving of labour seems also to be a means of covering up dirt.

The Secretary said that some time ago he gave his plan for cleaning plates, but he had not seen any one who used that method. He did not know whether its disuse was from a lack of knowledge, or because photographers did not consider it of much account; but it seemed to him to be the simplest and surest, that is, unless a substratum is used. He merely washed the plates under a tap; when washed they were placed on a piece of blotting-paper to slightly drain (but were never allowed to dry); they are then wiped with linen towels, used only for this purpose. These towels are washed in soda alone, no soap or greasy substance whatever being employed in their washing. A towel will clean fifty plates. He very seldom found any streaks on the plates so cleaned. The hand must not come in contact with the plate in any way. Fifty plates can be cleaned quicker in this way than twelve can be by the other process.

Mr. Anthony said he could bear testimony to the utility of the Secretary's method of cleaning plates. He had repeatedly seen its value tested.

Recent Patents.

AN IMPROVED CHANGING BOX.

BY GEORGE HARE.

The following specification described Mr. Hare's ingenious changing-box:—

My invention consists in an improved apparatus for effecting the transference of sensitive photograph plates from the plate box of the dark slide of the camera without subjecting them to the action of light.

The Ottewill changing box, long known to photographers, necessitates several independent acts, neglect of any of which endanger the safety of the whole of the plates contained therein.

In my improved apparatus I make the movements automatic and place them beyond the control of the operator, so as to render the admission of light impossible. I close the aperture of the box by means of a shutter acted on by two springs, this shutter being opened only by the attaching of the camera slide, to which the plate is to be transferred and closed by the act of removing it. Unlike any shutter of a similar kind, mine has a long tail-piece which acts between guides, and thus secures parallelism of motion. The shutter and springs are sunk into the body of the cover of the box, so as to be incapable of being tampered with without taking the parts asunder.

Instead of the rigid sliding tops peculiar to former transfer boxes, I employ a flexible sub-top which passes down into a well inside of the box. This sub-top may be formed of any flexible material, but I prefer a series of wooden laths, glued or affixed to a band of leather or textile fabric the full width of the lath, in the manner well known to makers of photographic apparatus.

Transfer boxes have previously been filled with plates from the top; in my improved box I insert the plates from the bottom.

The dark slide used in connection with this box differs from others previously constructed, by having the end aperture closed by means of a piece of metal or opaque material projecting from the back (which works on an axis at the further end), and which serves to exclude light from the plate. This back, which has a spring catch lock, and is so constructed that by pressure upon it the aperture is closed and the plate retained firmly in its place, while by lifting a bolt the plate is liberated, and the end thrown open to permit of its egress.

What I claim in connection with this invention is—

1. The inserting by means of morticing or otherwise in the body of the slide of the changing box, the metallic shutter with its springs and parallel guide pieces.
2. The flexible cover for the changing box, as described.
3. The hinging of the back of the dark slide at one end, together with the method of fastening in the photographic plate, by means of a spring catch-lock, brought into operation by pressing forward the back, as described.

MOUNTING PHOTOGRAPHS ON METAL PLATES.

BY JOHN TUCKER.

This invention for mounting prints on metal plates received provisional protection only.

My invention has for its object the mounting of advertisement sheets, placards, or posters, show cards, and tickets, school lesson sheets, public notices, maps, plans, photographs, and other papers, printed, plain, or ornamented, on zinc, iron, tin, and other metal plates, in such a manner that when so mounted such papers shall be weatherproof and dirtproof, and shall bear washing without injury.

In mounting papers according to my said invention, I coat with size both sides of the paper to be mounted and allow it to dry; I then take a plate of iron, zinc, tin, or other metal, and coat it with a mixture of copal varnish and lithographic varnish, and place the back of the coated paper on the varnished face of the said plate, and subject them to pressure so as to cause them to adhere firmly together. I then either allow them to dry, or stove them. When the paper thus affixed to the metal plate has become dry and the varnish has become hard, I coat the said paper with any suitable varnish (by preference copal varnish), and I finish by again stoving the said plate and paper.

My process is simpler and cheaper than the process of coating iron plates for advertisements with vitreous enamel and the process known as the French enamel process, and the sheets mounted, according to my said process, are durable (not being liable to chip), washable, and flexible.

Correspondence.

DARK TENTS.

Dear Sir,—In my letter dated June 2nd, instead of a light waterproof cape, by some misadvertance I am made to recommend a folding tripod to be carried by the tourist, attached to his wallet; this being directly opposed to my experience, I must beg that you will kindly allow me to amend it. In fact, I have always found folding tripods shaky, and liable to get out of order. The one I should recommend would consist of three firm but light rods of proper height surmounted by a small ball and socket joint. These, when bound together, will form a stout alpen-stock, aiding the tourist's progress considerably over rough ground, and prove a reliable safeguard amongst rocks. A fatal accident which occurred only a few day's since, through the fool-hardiness of the victim, impels me to caution tourists against the great danger of approaching too closely the brinks of precipitous cliffs. In dry weather the grass becomes as slippery as glass, and in many cases is considerably undermined by the falling of the earth from the face of the cliff. Thus, although apparently safe, they may be in a moment cast on the rocks beneath, or into the sea. I will also caution all against bathing in lonely places where no assistance is nigh, particularly on rocky coasts. I have often seen photographers in dangerous situations, incurred, no doubt, from a desire to obtain a more effective picture. This is a very questionable proceeding, for of what use can a view be, which can only be recognized at a risk of life? In all places worthy of the tourist's notice, there may be found intelligent persons, well acquainted with their localities, and willing to point out the best situations from which the most beautiful views can be seen; boy-guides conversant with dangerous places are usually easy to be obtained.

I am about to take my usual tour; should I glean any interesting matter, I shall in due course lay it before your readers.—I am, dear sir, yours very truly,

James Martin.

Clarence Place, Ilfracombe, June 6th.

DEVELOPING ALBUMENO-BEER PLATES.

Sir,—As an old and constant worker of Captain Abney's albumen beer dry plate process, I venture to reply to the query of "F. V." in your last week's issue.

I may state for the information of "F. V." that occasionally I have found landscape negatives develop to full and sufficient printing intensity; but transparencies, as a rule, seldom require intensifying. But it may be as well to state that Captain Abney prefers obtaining a very faint image only with the developer, and then exercises the power left in his hands of working up where necessary with pyro and silver, those choice high lights, &c., which are the *sine qua non* of a rich and delicate negative. There is, however, a strong objection to negatives that require no intensification, as they generally are too intense and harsh, and consequently yield undesirable, poor prints, wanting in depth.

W. B. D.

South Kensington Museum.

FADING OF PRINTS.

Dear Sir,—Why do not Mr. V. Blanchard and others who complain of their prints fading fix them in hyposulphite of ammonia, in lieu of hyposulphite of soda?—Yours faithfully,

Thomas H. Redin.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will be held at 5, Pall Mall, East, on Tuesday, June 13th, when a paper will be read by Col. Stuart Wortley "On the Preparation of Sensitive Dry Pellicle from Collodion and from Gelatine," and a note by Mr. W. Brooks "On a Dry Plate Exposed and Developed Fifteen Years after its Preparation."

Photographic Honours.—A paragraph in *Mona's Herald* (Isle of Man) calls attention to the rare success which has attended Mr. Marshall Wane's contributions to various exhibitions. Having commenced to exhibit only eleven years ago, he has been a recipient of eleven honours in that time, five of which take the form of gold medals; four bronze medals, and two certificates of artistic merit. All who have seen Mr. Wane's work will say that these honours have been deserved.

Patent Office.—Several changes are impending in the arrangements of this office. An order has just appeared which puts an end to the abridgments of provisional specifications. This will be a slight relief to inventors, and it is only an official acknowledgment of a fact that has long been obvious to all concerned, that these so-called abridgments were quite useless for any purpose whatever. This order is to take effect on the 1st of July next. Notice is also given that in future the drawings accompanying specifications will be reproduced by photo-lithography, and the copies of the originals filed for the purpose of reproduction are, after the 30th of June, to be sent in a condition such that they may be copied by means of photography. It is understood that it is intended to make a considerable reduction in the scale on which the drawings are published, with the object of economizing space and lessening the cost of printing. In order to give time for the examination of the filed drawings, the Commissioners of Patents request that they may be sent in at least six days before the expiration of the time allowed, thus limiting by a week the six months' provisional protection granted under the Act of 1852. It is likely that further changes will be made in the constitution of the office in pursuance of a report prepared by the Master of the Rolls and the Permanent Secretary to the Treasury, and that such changes will be in the direction of limiting the facilities hitherto enjoyed by the public in connection with the Patent Office Library and the issue of official publications. A proposal has been made that, should a national Library of Science be formed at South Kensington, the Patent Office Library should be incorporated therewith, but no definite conclusion on this point has been arrived at.

Remedy for Foggy Emulsion Plates.—Coat with the emulsion, as per directions on the bottle, and immerse or flow until all greasiness is gone in the following solution:—Water 8 ounces, iodine solution ¼ ounce, preservative solution 2 ounces. The iodine solution is made by adding tincture of iodine to a saturated solution of iodide of potassium, until no more is dissolved. The preservative solution may be omitted. Then well wash under the tap, and flow with a forty-grain solution of silver made acid with two or three drops of nitric acid to the ounce. Wash again, and flow two or three times with a ten or fifteen-grain solution of common salt, to get rid of any free silver. Wash and dry the plate, and develop as usual.—*Anthony's Bulletin.*

Etching Process.—In Ackermann's *Gewerbezeitung*, Herr Fichtner gives an account of a way of producing etchings in relief by asphalt. Select pieces of asphalt which do not melt at 90°, and are difficult to dissolve in turpentine; dissolve five parts in a mixture of ninety parts of benzole and ten parts of oil of lavender; the benzole must be separated by distillation from any impurities that would render it too sensitive to light (?), after which it must be thoroughly drained before being used. The oil must be perfectly free from water. Coat a perfectly clean and smooth zinc plate with the varnish, allowing the latter to run off like collodion; then dry in a horizontal position in the dark. Expose the plate under a negative from twenty-five to thirty minutes in the sun, or three or four hours in daylight, according to the sensitiveness of the asphalt film, which must be ascertained by experiment. The exposed plate is then developed with rock oil, to which a sixth of its volume of benzole has been added; the oil is poured over the plate, and moved about until the whites are perfectly clean; the plate is then washed under a jet of water, dried in the light, and etched with diluted nitric acid. There must be a careful avoidance of air-bubbles.

Mounting Drawings.—A correspondent of the *English Mechanic* gives the following directions for fixing pencil drawings:—"Lay the drawing on a sloping board, and pour boiling water gently over it: this will remove all superfluous particles of lead, and will bring some of the size in the paper to the surface; boil some isinglass or gum-arabic in water to make a very thin size; pour it on a flat dish to cool; run the drawing through the size, taking care that every part is well wetted; then lay it on a board to dry. The size should be so thin as to feel just a little sticky between the finger and thumb when cool. If too thick, it will be seen on the drawing after it is dry. I have tried many ways of fixing drawings, but have never found any to equal this." Another writer says:—"The best solution to fix drawings is that made with gum tragacanth. It sizes the paper; it fixes the pencil drawings; it does not chip when wetted; it enables you to continue the drawing afterwards if desired; and it is possible to colour over it."

Improvement in Freezing Mixtures.—M. Dubrene, says the *Moniteur Industriel Belge*, has devised a means of producing refrigerating mixtures which will give varying degrees of cold, as may be desired. The invention is based on the fact that, when nitrate of potash, or, better, nitrate of soda, is added to nitrate of ammonia (the added salts not exceeding a certain proportion), the resulting mixture produces, by its solution in water, a lowering of temperature very nearly equal to that produced by nitrate of ammonia alone. It is thus that, in making mixtures in which the nitrate of soda enters in the proportion of 1 to 40 parts and the nitrate of ammonia in the proportion of from 99 to 60 parts in 100, compounds are formed by which temperature may be reduced by Fahrenheit degrees varying in number between 70 and 482. A mixture of 20 parts nitrate of potash and 80 parts nitrate of ammonia reduces temperature 87° Fahrenheit.

To Correspondents.

R. Jackman.—The lens you mention is well suited for your purpose. It is suitable for cabinets, and will yield good results in group portraiture on a whole plate; or, with a small stop, which might be used in bright weather, on plates of a size larger.

Operator.—The probable cause of the tardy precipitation of your chloride of silver is the presence of a large quantity of water, and very little silver. When the silver in print washings, often containing very little silver, is precipitated, it is frequently very slow in falling, the chloride remaining in suspension merely making the water look milky. Time is the chief thing required; but you may facilitate the precipitation a little by adding a little nitric acid. 2. To photograph objects in chased silver requires considerable care and skill. It is important, in the first place, that the object be placed in a light as free from irregular reflections as possible. A somewhat new and freely bromized collodion should be employed, and a moderately strong developer. Hollow vessels, such as cups, vases, &c., are sometimes easily dealt with by placing a piece of ice inside: this suddenly cools the vessel, and causes a very fine deposit of condensed moisture on its surface, which, without injuring the design, subdues the reflecting brilliancy of the surface, and renders it easy to photograph.

Excelsior.—The lens of which you speak has a short focus, and is generally found suitable for working in confined situations. Consult its maker as to another suited to that special purpose. 2. We have tried Weston's burnisher, and approve of it very much. It is greatly superior to an ordinary rolling press. 3. We have used a wooden bath lined with pure india-rubber, with advantage, for years.

J. H. W.—The photographs enclosed are excellent, and unusually delicate for dry plate work. Which form of the coffee process do you employ? The plates are manifestly very sensitive.

H. D.—The precipitate is citrate of silver. If the nitrate of silver be tolerably neutral, it is apt to form a precipitate with citric acid. The addition of a few drops of nitric acid will prevent this occurring, and will also redissolve the precipitate without materially interfering with its action as an intensifier. In our own practice we prefer to keep the citric acid solution and the silver solution separate.

R. M. L.—In the process of intensifying to which you refer the plate, after developing, fixing, and washing, was dried and subsequently intensified. Before intensifying, an edging of black varnish was applied to prevent the risk of the film becoming loose. It was then moistened with water, and a five-grain solution of bichloride of mercury applied until a uniform grey tint was produced. The film was again washed, and a one-grain solution of iodide of potassium was applied until a greenish drab tint was produced. The colour was very non-actinic, and the negatives very delicate. The chief disadvantage of the process was a tendency in the negatives to grow more intense during long printing. This, it was said, could be corrected by submitting the negatives to great heat.

L. R.—Albumenized prints should be sized with gelatine or isinglass before colouring with oil; otherwise the oil will sink into the paper, and the colours would not "bear out" satisfactorily. Ordinary oil colours, such as are sold in tubes by artist's colourmen, are employed, some medium, such as macgilp, being used to thin them with. Several paintings will, of course, be required. When finished, an oil painted picture should not be varnished for a year or two. Mastic varnish is best.

Puzzled.—You do not state how the toning bath was made, hence it is difficult for us to say why it refuses to tone. A toning bath will become inert from many causes: sometimes because it has become exhausted of its gold; sometimes because it has from some cause become decomposed. A very common cause with beginners is touching the solution with fingers which have been in contact with hyposulphite of soda. If carbonate of soda have been used to neutralize the chloride of gold, the solution loses its toning quality in a few hours. Write further details, and we can probably help you.

G.—The responsibility of printers for the safety of negatives entrusted to them for printing has never been legally decided. It is a matter rather for arrangement than litigation.

Several correspondents in our next.

The Photographic News, June 16, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Diplomas for Members of Societies—Colouring Carbon Prints—The Action of Light upon Pigments.

Diplomas for Members of Societies.—It is in the nature of things that human beings should grow discontented; and photographers are no exception to the rule. We may include chemists also in the category; for recently the Fellows of the Chemical Society have been crying out for much the same cause as members of the Photographic Society did some years ago. Ambitious members wanted to write M.P.S., or F.P.S., or some such letters, after their names, to show the world that they were photographers recognized by the principal Society in Great Britain; and the Fellows of the Chemical Society, being a chartered society, and, therefore, entitled to wear letters after their names, have now grown dissatisfied, and, like poor Oliver Twist, are also crying out for more. They want, so far as we can make out, their Society to be constituted like the Pharmaceutical Society and the Institute of Civil Engineers combined. They desire—or, at any rate, some of the Fellows do, who are snugly inside the pale of the Society—that the letters F.C.S. shall constitute a diploma in the eyes of the world, and that only thoroughly qualified and brilliantly distinguished chemists (? like themselves) shall be admitted to the honour. They are of opinion, in a word, that the F.C.S. should be bestowed in the same way as the title C.E. is conferred by the Institute of Civil Engineers. We hardly think they will carry their point, any more than photographers have been able to achieve distinction by constituting themselves members of the Photographic Society. It is something, no doubt, to belong to a society and to devote time and money to the development of an art or science; for even those who take no part in the reading of papers help with discussion, or with their presence and support, to further the ends of an investigation. But it is hardly enough to base any serious claim upon. The Berlin Society have, however, recently hit upon a plan to which little objection can be made. The members of that body have decided upon issuing a diploma—or rather, perhaps, we should say certificate—to all those who have taken part in the deliberations of the Society for at least two years. Photographers, therefore, who join merely for the say-so, and quit the ranks again, after paying a first year's subscription, will not become entitled to the document; but they must have been *bona fide* members for two years before becoming entitled to the distinction. We think the Berlin Society have acted with some discretion in the matter, for our friends on the Continent (more than ourselves) are rather taken with honours; and while they will secure, therefore, what they desire, the certificates will not be given away indiscriminately. Perhaps some such arrangement would satisfy those at home who have been advocating the adoption of some distinguishing mark by the members of the Photographic Society. At any rate, they will like to know what is doing abroad in a matter in which they have taken an interest.

Colouring Carbon Prints.—The matter of producing coloured photographs, such as are now obtained in Paris by M. Leon Vidai, has been attracting some attention in Germany, and among other suggestions is one by M. Grüne, the well-known photographer. His idea is to produce, in the first place, a carbon photograph upon glass, and to colour this by hand-painting upon the image film. The painting is done by means of colours mixed with gum and bichromate of potash, and for this reason, we suppose, the operation must be conducted in the dark. After the colours have been laid on as smoothly and brilliantly as possible, the transparent picture is exposed to light from the reverse side, and the bichromate, becoming insoluble, fixes the colours. The picture is then transferred to paper in the ordinary way, and the brilliant effects of the painting are said to be very great. By colouring the image from the back, the outlines of the latter, when the print comes to be transferred, cover up many defects in the painting, so that this need not be so very finely executed in order to produce a good result.

The Action of Light upon Pigments.—Mr. R. H. Bow's paper, read at Edinburgh, regarding the action of light upon pigments employed in painting, touches upon a subject which has worried artists a great deal recently. Indeed it was for the purpose of teaching painters something about the pigments they employ that the Royal Academicians decided upon the appointment, some time ago, of a Professor of Chemistry, and lately lectures have been regularly delivered to students on the composition of the colours they employ. Mr. Bow tells us that his experiments have led him to the conclusion that Prussian blue in oil is the most stable of colours; but it does not follow for this reason that it is the most suitable for painters. Most artists are aware that the light will act upon the majority of their pigments after a time, and for this reason they not unfrequently produce more vivid effects at first, as they are quite sure that after a few years these will become softened down by the bleaching action of the light. As their canvas is sure to fade in some parts, let them take what care they like, it is the best policy for them to employ oil pigments, possessing as much as possible the same photographic properties, so that they may alter in something like the same degree. A picture seldom loses much of its beauty by becoming of a lower tone than when first painted, provided the change that comes over it is not too marked. It would never do, for instance, to employ the fleeting aniline pigments upon the same canvas with the stable Prussian blue, painting one portion of a picture with the former and another with the latter. In fact the aniline colours are for the most part quite unsuited for painting purposes, and some of them are so changeable in the sunlight that they have been used for the production of photographic images. Again, they are extensively employed—especially in Germany—for colouring photographs, their thin transparent character rendering them particularly suitable for the purpose, for it is possible to see the shadows and outlines of the image beneath the layer of colour; but photographs tinted in this way soon lose their bloom, and the colours are often seen fading while the pictures are yet exposed for sale in the shop windows. There are very few pigments indeed which are not acted upon by light to some degree, and for this reason it is that pigment or carbon prints are said not to be permanent; but there are, at the same time, many colours known to chemists and artists which are sufficiently stable for practical purposes. Indeed, if we push the matter far enough, we may well ask if anything exists on earth that is proof against the continued action of the sun's rays, and whether the words permanent and unalterable, as applied to worldly matters, is not altogether a misnomer.

FURTHER EXPERIENCE WITH COLLOCINE.

BY WILLIAM BROOKS.*

It is now two months since I read my first paper before this Society relating to Mr. M. Carey Lea's new collo-restrainer, and since its introduction I have used it in preference to glacial acetic acid—not on account of its cheapness, but from the firmness of the deposit that it gives, and the reduction of the time of exposure, which I consider two very great points in its favour. I was pleased to read Dr. Nicol's experience with it in the *British Journal* for May 26. The product he succeeded in making, he says, has a specific gravity of 1,159, while the sample made by myself has a specific gravity of 1,190; the difference is, probably, owing to the different strength of acid used, and the sample of gelatine; but our results in its use seem almost to coincide.

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* Read before the South London Photographic Society.

I must not omit an important point in the manufacture of collocine. After the proper time has elapsed in boiling I do not strain at once, as recommended by some, but allow the surplus metallic zinc to remain for at least twenty-four hours, and by that time nearly all the free sulphuric acid is converted, so as to leave the finished compound as nearly neutral as possible.

Several friends have sent me samples of their own making, and I have found them all more acid than my own. One sample in particular smelt very strongly of acid; and by using a sample that is strongly acid the full value and power of it *cannot* be gained, although an acid sample will work.

We have formulæ in use for acid developers and alkaline developers, and I find that the one in question, made with collocine as a restrainer, may almost be called a neutral developer, as this one seems to step in between the two.

I have been experimenting with a developer which I made as neutral as possible, and found it to work well. I think this may, in some way, account for its rapidity; for we are all perfectly aware that a small addition of acid to the ordinary developer makes the exposure much longer; but it is safer to work the developer *slightly* acid.

I have not as yet determined the smallest quantity of collocine possible to work with to keep the plates from fogging. It will be seen in the formulæ at the end of this communication that I have reduced the quantity recommended in my former paper, and with advantage. I have heard several say they do not like the colour of the deposit it gives; in practice myself I have not found the colour at all objectionable.

I here give several formulæ I have been experimenting with, and have found them to work well for a general developer plain and simple:—

No. 1.

Protosulphate of iron	5 drachms
Water	20 ounces
Collocine	2 small drops
Alcohol	*quant. suff.*

This developer can also be used for glass positives and ferrotypes.

No. 2.

Protosulphate of iron	10 drachms
Water	20 ounces
Collocine...	2 small drops
Alcohol	*quant. suff.*

This developer is more rapid than the former.

No. 3.

Protosulphate of iron	5 drachms
Water	20 ounces
Collocine...	2 small drops
Gelatine	10 to 20 grains
Alcohol	*quant. suff.*

After the image is fully out by adding a few drops of silver it can be used as an intensifier; the only drawback is that it becomes rather turbid in about a week, but works just as well. I may also mention that it gives a browner deposit than the former.

No. 4.

Protosulphate of iron	5 drachms
Water	20 ounces
Collocine	2 small drops
Gum and sugar solution	½-ounce to 1 ounce
Alcohol	*quant suff.*

The gum and sugar solution is the same as used by Mr. Lea in the preservative of the last emulsion process that he published. This gives full printing density with one application of the developer, providing the plate is not over-exposed.

No. 5.—*Proto-nitrate of Iron Developer.*

Protosulphate of iron	5 drachms
Water	10 ounces
Nitrate of lead	1½ drachm
Water	10 ounces

When dissolved, add the two solutions together, filter out the white precipitate (sulphate of lead), and then add two small drops of collocine and the requisite quantity of alcohol.

This developer I like better than any I have tried. It gives a finer deposit than any of the former, and full printing density is gained with one application, as the negative I pass round will show.

I have not yet had time to speak as to the keeping qualities of this proto-nitrate developer; but I should think, so far as my experience goes with it, that it will keep far better than with an acid used as a restrainer.

OBSTACLES TO PHOTOGRAPHIC PROGRESS.

BY R. W. ALDRIDGE.*

In addressing you to-night I cannot but feel how inadequate must be a paper of this nature to the extent and importance of the subject, where, perhaps, any one of its branches would, to do it justice, require greater time than the necessary limits of these papers will allow me to devote to the whole. It is, therefore, principally in the hope that the following observations may call your attention to our difficulties, and provoke that discussion which can scarcely fail to benefit the art, for, as old Homer says—

> "Such brave contention works the good of men."

It is with this motive, rather than the hope of settling by any words of mine any of those points under review, that I venture to bring the subject before you.

If I were required to characterise the present stage of the photographic art, I should call it the "age of uncertainty." Were I disposed to be cynical I might, perhaps, call it the "age of nostrums." No sooner does one practitioner meet with a mishap (and what photographer does not?) than a dozen others rush to the rescue, each with his own infallible cure, which is so simple and so certain that it really appears ridiculous on the part of the poor patient to continue to suffer from a complaint that ought to be wiped from the face of the earth; and yet, for all these certain remedies, our photographic infirmities are very numerous and, I will venture to say, very real. At present not only our methods of working, but our chemicals, the tools with which we work, and, though last, not least, the paper which generally forms the groundwork of our pictures, are all open to doubt.

It has been lately demonstrated beyond the power of contradiction that a photographic "thing of beauty" is not "a joy for ever." The fading of the silver print is beyond all question; and in this matter of permanency it is but too evident that we have actually retrograded. This is a matter deserving our most serious consideration; the want of permanence is an obstacle that must be overcome if the art is to maintain its proper place in the eyes of the world. Photography at the present time seems to have reached a similar stage to that of painting in this country during the latter half of last century. One artist at that time contended that the secret of producing great works was to be found in the use of wax; another would ascribe as the great panacea soap-suds, or some other compound equally secret and equally nasty. These quackeries excited the disgust of John Opie, who answered some inquirer for a recipe for the making of great pictures by advising him to use his colours "with brains." This eminent artist also tells us of a young lady, still in her teens, who undertook to teach Royal Academicians how to paint for the small consideration of five guineas each.

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* Read before the South London Photographic Society.

Our "process-mongers," as our friend Mr. Jabez Hughes appropriately styles them, have greatly improved upon this very modest estimate of the value of their great arcana, and would certainly look down upon so small a payment. I think one of the best arguments that could be adduced against those who call in question the respectability of photographers might be drawn from the large sums of money these skilful practitioners manage to withdraw from the overflowing pockets of our too-confiding brethren. These secrets are sometimes to be paid for by a handsome *douceur* and a promise of secrecy, but more commonly take the form of a patent. These patents I consider to form one of the most annoying obstacles to photographic progress. The pretensions to originality are often of the most meagre character.

Not long since there was the "what-shall-I-call-it process, for improving photographs into works of fine art." This was effected by means of crayons and pumice-stone. Now, in crayon-painting crayon and pumice-powder generally go together. There is a paper made for the purpose called "*papier pumicif*," or pumice-stone paper. It was acknowledged by the patentees to be a customary thing to use the pumice along with the pastels; but we were gravely threatened with various pains and penalties if we should in any way get them mixed. Another patent introduced a no less ridiculous obstacle to our progress in the way of retouching. No objection would be raised, we were told, to our putting tissue-paper on either side of the glass negative; but to put it on both would be an infringement of the rights of the patentee. These things would be exceedingly ridiculous if they were not, at the same time, hurtful to the photographic art, and, to my thinking, also lowering to the character of those who set up these obstacles to our progress.

Another difficulty, especially to those whose pockets are not overflowing with "that good, that golden mean" which has enabled men to overcome so many obstacles both in and out of the profession, is found in what I will venture to call "the great lens monopoly," by which we are obliged to pay a heavy price for a necessary tool, and that article, if required to be anything beyond the ordinary calibre, generally of a very unsatisfactory character. In speaking of lenses I here mean more especially portrait lenses up to a certain size—say, whole plate. They can undoubtedly be had of good quality; but every step beyond that size only demonstrates their imperfection either in the great length of time required for the sitting, or in the want of depth, which latter gives a bad definition, a want of focus, and the resulting false perspective. Now that I have enumerated some of the principal obstacles to our present progress, I feel very much inclined to quote the old maxim, "There is no obstacle to him that wills." At any rate, while rejoicing that we have got so far, I certainly think we have not reached that stage when we should rest and be thankful. I shall certainly rejoice if these few remarks should induce any older and abler member than myself to take up any one of these obstacles, and show us how to overcome it.

ON SMALL SCALE MAPS FOR TOURISTS.

BY R. H. BOW, C.E., F.R.S.E.*

By the term *tourist* I do not mean a creature who rushes by train over an interesting route, however much he may gaze about, and, painfully to himself and his fellow-passengers, crane his neck out of the railway carriage window; nor his brother excursionist who, on top of coach or deck of steamboat, hurries on his way in spite, it may be, of darkness or mist, only determined to *do* the thing, and taking more interest in doing it swiftly than in observing the scenery, or noting the historical mementoes or natural features that have rendered the district a fitting arena for the creations of the poet, or made it the favoured haunt of the artist or the antiquarian. Perhaps, at the present day, the tourist worthiest of the name is he who judiciously combines pedestrianism with the abundant facilities of being conveyed from one centre of interest to another. But even one who does not shine as a walker may yet gain a delightful experience and an intelligent, though limited, knowledge of a district by making full use of his opportunities from the top of a coach or the deck of a steamer, supposing him fortunate in weather, and well informed as to what he should see, and when and where to look for it. For these latter provisos, however, a really good map is indispensable. But the difficulties and discomfort attending the process of referring, in the open air, to a folding map are so great that, rather than subject himself to the ordeal, he will too often allow what might have proved subjects of great interest to him to pass unheeded by; and often afterwards he may have to regret the lost opportunities.

We no doubt have all experienced, and watched others experiencing, the discomforts of this operation of referring to a folding map, it may have been on the top of a coach, or on board a steamer going at speed; how that map did keep writhing and wriggling about, defying all careful inspection, and, perhaps, at last flying loose like a flag in the breeze, and getting itself torn into shreds, or making its escape from the binding altogether.

But why should we be left in this ridiculously helpless condition when, by means of photography, all that the unmanageable map contains could be condensed into one or two small pages of a guide-book or pocket-atlas? I have, during some years back, frequently urged upon lithographers and others the expediency of publishing such maps, and can only marvel that the desideratum has not yet been supplied.

Some years ago, one-page detailed maps of the more interesting parts of Scotland were given in Murray's Time Tables; and I am sure very many persons must have highly appreciated the convenience of referring to these. They have now, unfortunately, disappeared from that guide-book (probably the smallness of its price would not permit of their continuance), but I feel assured that a thin pocket atlas of similar maps would find a ready sale. What I in this paper propose is, to go further in the same direction: to produce maps not requiring to be unfolded, and yet by calling in the aid of photography to render them rich in information, though small in size.

Held firmly in the hand, all that would be required is a lens of (say) two or three inches focal length to read the smaller lettering; such a lens may be bought for a shilling, and every botanical student carries a more powerful one.

Visibility to the Unaided Eye.—The legibility of printed matter depends—

1. Upon the lettering being of a good bold character on a good paper.
2. Upon good lighting, daylight being much better than any artificial light.
3. Upon the focal adjustment of the eye being well suited to the distance of the object; and,
4. Upon freedom from astigmation, or other defects of the eye.

All these requisites for perfect vision being given, print may be read, though placed at a distance equal to 800 times the height of the smallest letters. But for ordinary eyes, under very moderately favourable circumstances, 500 times may be taken as a limit of distinct vision, and in order that reading may be performed with comfort we may assume 400 times the height of letter as a standard.

Probably the majority of persons are able to adjust their eyes to read at a distance down to 8 inches; the 400th part of this is $\frac{1}{50}$ inch, for the height of letters they will be able to read readily in a good light, and if assisted with a seven or eight-inch lens, they should be able to read good lettering of the height of one-hundredth of an inch. A long-sighted person, just able to bring parallel rays to a focus, would require a lens of four inches or shorter focal length to read the print having a minimum height of 0·01 inch.

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* Read before the Edinburgh Photographic Society.

In the cases of several reducing processes for printing on ordinary paper, I am disposed to think that the reduction in size should not be carried beyond, or much beyond, this limit of 0·01 for the height of the smallest letters. The chief considerations which lead to this conclusion are—the difficulty of procuring dense negatives without having the finer lines more or less closed up, and the coarse blanket-like nature of the surface of ordinary papers, as seen under a moderately magnifying power. In even very excellent map and print work, the amount of imperfection in the lines disclosed by the microscope is very surprising.

When the printing is to be done photographically, either on albumenized paper or similar surface, a greater reduction may be ventured upon. And if the final prints are to be on collodion, either as positives or as thin transparencies transferred to white mounts, a very greatly increased reduction may be adopted if desired. I here show a positive collodion copy of sheet No. 25 of the Ordnance Survey of Scotland reduced to a scale of nine and a-half miles per inch. To give an idea of the minuteness of the lettering in this, we may take the word "station" near Melrose; the length of this in the copy is only the one-fortieth of an inch, and the height of the letters one three-hundred-and-fiftieth of an inch, or less, and judging from the distinctness it is evident that good lettering one five-hundredth of an inch in height would have been legible.

The usual lettering in this map is not very well adapted for reduction, being of script character, with very fine hair strokes.

This leads us to the question of how fine the lines to be copied may be made. Among the many circumstances upon which the reply will depend, the three following are the most conspicuous:—(*a*), the perfection of the definition of the lens; (*b*), the degree of intensity to be given to the negative, and, perhaps, upon its chemical character; and (*c*), the final process to be followed in producing the prints.

The lens question is a very important one, but I shall here dismiss it with two brief notes.

1st. The finest central definition will be got with the lens of shortest focal length; but the focal length must be chosen sufficiently long to suit the size of the negative to be produced.

2nd. A very small aperture may be used, but the benefit as regards definition, even for the oblique pencils, has its limit from the increasing bad effects of diffraction. A number of years ago I experimented upon an ordinary view lens having a focal length of four and a-half inches, placed with its flat side towards the stop and view. I found that for direct pencils the most perfect definition was obtained when the diameter of aperture was one-eighteenth of the focal length. When the aperture was made less than this the confusion arising from diffraction more than counterbalanced the benefit of further reduction of the spherical aberration. But the best size for oblique pencils would, of course, have been much smaller than this. I have recently been trying an aperture with a diameter only the eightieth of the distance from the plate to the lens.

(*To be continued.*)

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BUILDING A SKYLIGHT.

BY E. L. MCINTOSH.*

For the readers of the News, I offer the following directions for building a skylight, which I think is ahead of any that as yet has come under my observation, and I will say that those who adopt my plan will never be troubled with a leaky light. I will describe my own light, and if any are impressed with its merits, they can vary the proportions to suit the occasion.

The outside pieces are 2½ by 3½ inches; middle rails, 1½ by 3½ inches. The side pieces each have a mortise at the corners one inch square; the end pieces have a tenon the same size, and they go together the same as the frame of a building. Each middle bar has a tenon one inch square at the upper end, and a shoulder at the bottom end; the upper outside piece having mortises to correspond with the tenons in the middle rails, and the lower outside rails having notches sawed to correspond with the lower end of the middle rails. The middle rails should be shouldered from the under side, so as to bring the top of the outside piece and the middle rails on a level with each other. There should be a shoulder half-an-inch wide for the glass to rest on, in both inside and outside rails. Underneath the glass there is a gutter half an inch deep, which extends the whole length of all the rails that run up and down; the outside rails on the sides, also, have a gutter the same size and depth cut on top near the outer edge, which comes under the shingle. I have shingled out even with the glass, which makes it water-tight. The upper outside rail; instead of having a shoulder for the glass to lay on, has a groove cut half an inch deep, into which the glass slides, and keeps the water from soaking through the putty. The whole goes together with a few screws in the corners and in each end of the middle bars.

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ON THE ACTION OF THE BLUE, YELLOW, AND RED RAYS UPON THE PHOTO-SENSITIVE SURFACE.

BY THOMAS SIMS.*

It is not the fault of the Photographic News and its kind Editor if the readers of that journal are not well up in all that is possible to the collodion process. I would now, therefore, state in brief outline the *modus operandi* of the Daguerreotype process, in order to set before the readers my standpoint of observation, and that they may draw their own inferences from its peculiarities.

A surface of pure silver, chemically cleaned and polished, is placed face downwards on a glass pan containing crystals of pure iodine; a ray of light is passed from a mirror at the off side the pan to the plate, and from the plate reflected to a small mirror on the near side, where the progress of the plate is watched. The progress of the sensitizing operation is indicated by a consecutive series of colours, one dissolving into the other in rapid succession, beginning with the palest tint of lemon yellow, and increasing until it assumes a full golden yellow, orange, and red, from that to rose red, and violet, and blue; this latter turns over into a neutral green, which is the second round commenced; the lemon yellow overlapping, as it were, the blue, and the same series of dissolving colours follow, but with more intensity.

Now, of all those positive colours formed by what has been called the molecular depth of iodate of silver, the first or second yellow was invariably selected as the most sensitive of the violet rays. The yellow of the second round was best, for though not more sensitive it had greater depth. This is, in fact, the dry process of Niepce and Daguerre; the one applied it to leather, and the other to silver. What is the comparative value of the sensitiveness obtained to meet the requirements of light, containing, as it does, waves of diverse refrangibility? It is clear that we have practically before us every degree of correlation to the necessities of the case, only at separate intervals of time although but short. It was neither the crimson nor the violet colour which had strongest affinity for the violet rays, but the yellow

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*_*Western Photographic News.*

* Continued from page 274.

in this case; and if we allow ourselves to theorise, it would be more consistent with general laws, and the special ones in regard to colour, that those colours which have, or appear to have, opposite powers have the strongest affinity to each other. This truth was generally believed by Daguerreotypists, because easily put to the test, by iodizing the same plate up to two or three different degrees. One portion was stopped off at yellow, and another at red, and another at blue. Scientifically, it would be interesting to know what would be the precise indication of the well developed spectroscope upon this surface.

The Daguerreotypist, however, obtained ample data upon this point without desiring it, for if a plate, by accident in the manufacture, or if unduly pressed upon at the back by the fingers instead of a plane surface, infinitesimal undulations were formed, a series of Newton's rings would be the result, which, after exposure and development, would exhibit corresponding gradations in circles or waves regulated by the meandering or circuitous inequalities, and the impression practically worthless. Plates so prepared, and properly exposed in the camera, or by having a piece of lace put upon it in the light, had a negative image formed; those parts where the light had acted being a dull blue, and where the light had not acted yellow, the demi-tints intermediate shades of colour.

The darkened portions were those of which it could be said that the mercury would fasten itself to them, whether flowed over, or the vapour driven upon it; and, consequently, the condition of the surface can be most confidently described as being before the action of the light without magnetic affinities, and after the action divided into electro-magnetic conditions of a positive and negative kind, and in degrees corresponding with the degree of energy with which the light had acted upon the sensitive preparation. Here, then, in the first stages of photography (and I cannot see that any one has suggested a better name for this branch of science used in its derivative sense, phos or photos, and as a generic term, because some of your correspondents would substitute a specific for a general term) we have a good analysis of the elements of the problem induced and produced by light under well-defined and restricted conditions.

I have partly anticipated the action of mercurial delopment, but the attention should be restricted to the facts connected with the sensitizing of the pure silver surface, the simplest form known, one of the first in order of time, and because easily reverted to as a standard of scientific comparison of great importance, because of the number of truths definitely taught by it.

Time of Exposure in the Camera.—The time of exposure is from two to twenty minutes in sunshine, the results (hard when developed) showing great insensitiveness to the yellow and red rays, and all intermediate compounds of them. Daguerre looked for a full-blown image, and, therefore, exposed unnecessarily long for the latent one; but having obtained the image, he put it in a drawer containing loose mercury, and the mercury, by accident, flowed over the plate, and became fixed to those parts where the light acted; hence the discovery—a Providential reward to a hard-working and enthusiastic artist, but exhibited by chance, and forming a final link in the series of differences between the molecular forms of colours and black and white, for the white of a Daguerreotype, when transferred to *white paper*, is a *black* equal to blacklead, of which a more matter-of-fact account in the course of this paper.

The vapour of chlorine which was the next element introduced, and called an accelerator, and did service for the time, was supplanted by the vapour of bromine; but neither chlorine nor bromine, nor a mixture of both, would give a camera image on a pure surface of silver without the iodine first. The bromine did, however, when the silver had an infinitesimal film of organic matter upon it. This would happen when a weak solution of caustic potash, alcohol, and water was used with tripoli to clean the surface of the plate, and, possibly, the pellet of cotton necessary to apply it would, under the circumstances, take it from the fingers, in whatever way it would come by accident in the process; and the result is another cause of prismatic colours, which frequently gave a bloom of colours, even after fixation with hyposulphite of soda, and sometimes after the reduction of the gold film upon it. The colours were not a translation of the colours of nature, but were most probably the result of the combination of the prismatic colours of the sensitive coat, organic matter, and silver, and scarcely would the plate be cold before every sign would be gone. This never happened in damp weather, but when all the apparatus was perfectly dry, and when meteorological conditions were favourable to electrical experiments; in damp weather the result would be simply a veil over the image analogous to what is called fogging in the collodion process.

Bromine was not only an accelerator, it also extended the range of adaptation of the sensitive surface to the more non-actinic portion of the spectrum. I never could get, and never heard of any one obtaining, a camera impression on a pure silver plate with bromine vapour alone, but in combination with very little organic matter, easily. And upon well sized, hot pressed writing paper, treated with bromide of potassium and nitrate of silver, camera images can be obtained as quickly as by the collodion process. They are latent images, to be developed with mercury vapour, and the result, a negative having the qualities of a blacklead drawing.

Without troubling the reader about the groping after a fixing solution which early photographers had, I merely state that when a bottle of hyposulphite soda was poured over a Daguerreotype plate, the molecular conditions of prismatic colour faded like the baseless fabric of a vision, and, as a rule, left nothing but the mercurial white and the black of polished silver—so near, and yet so far.

With more or less use, as far as our knowledge is concerned, galvanic and other forms of electricity and heat of different degrees were tried to extend adaptation to colours and increase rapidity, without any satisfactory results.

(To be Continued.)

STUDIO HINTS.

BY D. H. BROOKS.*

Save ether and alcohol, but clean up your collodion bottles with potash or concentrated soda and soft water; rinse well with soft water, using a swab. The best is made of a sponge sewed on the end of a strip of whalebone, bent by heating to the desired shape.

Use a feather for swabbing and cleaning out funnels.

Use a cut quill as a silver solution drop dipper, when preparing to intensify, simply by cutting a notch in the quill half an inch or so from the tipped end, and then clean out the quill so that the end is open.

Use camphor, gum or spirits, in any gum or mucilage solution, or paste; it prevents decomposition.

A good, strong, and cheap mounting glue is made of dextrine and gum-arabic. Dissolve the dextrine in water, and heat till clear and like syrup; then add thick gum solution; stir, and heat to boiling point. It keeps well, and when dry will re-dissolve to good advantage.

A New Nickel-plating Solution, said to yield beautiful results, is prepared by mixing the liquid obtained by evaporating a solution of half an ounce of nickel in aqua-regia to a pasty mass, and dissolving it in a pound of aqua-ammonia, with that obtained by treating the same quantity of nickel with a solution of two ounces of cyanide of potassium in a pound of water. More cyanide renders the deposit whiter, and more ammonia renders it greyer.

Anthony's Bulletin.

The Photographic News.

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PHOTOGRAPHIC PROGRESS.

The title of Mr. Aldridge's paper, read before the South London Photographic Society at the last meeting, was at once comprehensive and interesting. The consideration of "Obstacles to Photographic Progress" might worthily occupy more than one evening of more than one photographic society. Mr. Aldridge, not unnaturally, apologized for the necessary inadequacy of one paper to the extent and importance of the subject; and this being so, it was a little unfortunate, we think, that the especial phases of photographic progress marked for consideration were not indicated at the outset. The term "photographic progress" is not only comprehensive, it is somewhat vague besides. Photography has many phases, the progress of which might be considered. Regarding the term within strictly-defined limits, photography is simply a technical art, of comparatively recent discovery, the rapid progress of which is almost without parallel. In its strictly technical aspects it is nearly perfect, affording facilities for the skilled hand to produce results of marvellous excellence. Of course, its range is limited; but within the range to which it is inevitably bound, it leaves little to be desired in beauty of result. The stigma of instability, for some years the one serious drawback of the art, is passing away, equal beauty, with unquestionable permanence, being obtained by the carbon process; whilst the progress of photo-mechanical printing during the last few years has placed photography upon a level with engraving amongst the graphic arts. Speaking generally, there have been marvellously few obstacles to photographic progress, and its advance in every practical phase has been steady, rapid, and certain.

It is principally in relation to its professional aspect that the subject comes under Mr. Aldridge's attention. Wherever photography is adopted as a profession, pecuniary considerations affecting its practice must possess especial interest. A primary grievance from which, in Mr. Aldridge's estimate, the photographer suffers, is the existence of "process-mongers." We can scarcely look at their existence as a serious grievance, inasmuch as the matter is so completely within the hands of the photographer that it need never cause him even a passing inconvenience. The process-monger offers to sell a certain thing, which the photographer can purchase or leave alone as he chooses. Sometimes, indeed often, the purchase must be made in the dark, and may, as it often does, prove worthless; but he who buys a lottery ticket must be prepared for drawing a blank. Perhaps in the majority of instances the "secret" has already been published in the journals; and the diligent student of the current photographic literature will rarely be tempted to purchase a secret process. The term "process-monger" had its origin in the United States, where the genus is rife and successful, as we learn from the frequent denunciations in the Transatlantic journals. In this country the number of so-called secret processes offered for sale has not been large, nor have the sums charged been large, nor the processes vended entirely worthless. It is true that industrious reading of the journals might, in many cases, have put the purchasers in possession of similar processes; but even then much time might have been necessarily spent in testing several, prior to selecting one. If the "process-monger" were really in possession of a secret of value which was carefully veiled from the general community, his conduct might really, in some sense, be regarded as antagonistic to photographic progress; but, as in Mr. Aldridge's paper, he is evidently regarded as little better than an impostor, we can scarcely see that, on the whole—at least in this country—the process-monger has been a serious obstacle to photographic progress.

Mr. Aldridge associates the vendor of secret nostrums and the patentee of processes in one common category. As a patentee must, in order to secure his patent, publish full details of his invention, such publication must be much more conducive to progress than keeping it secret. And as a patentee has an interest in working out his process to perfection, much greater than if he had no special property in it, the patent is in this manner often also an aid to progress. In some cases it may happen that an invention of doubtful novelty may secure letters patent, and so, by the threat of vexatious litigation, bar progress; but this is very rare in photography. In almost every instance of discussion on legitimacy of patents in photography, the claimant for protection has introduced a new result, which by its excellence has induced photographers to purchase licences. Objectors have been able to say: This, that, and the other portions of your method were familiar before; but the inventor has generally been able to ask, in reply, Was the result I produce familiar before? On the whole, we cannot see a single branch of photography the progress of which has been retarded by a patent.

Mr. Aldridge's final obstacle to progress is what he terms "the great lens monopoly," by which he means the necessity of paying a heavy price for a necessary tool. The idea of calling the manufacture and sale of lenses a monopoly, must be intended as a jest. There can be no monopoly where there is the most untrammelled competition. It has so happened that in virtue of great scientific and practical knowledge, higher skill, and more fastidious care, English opticians can command the markets of the world. In the best studios of France, Germany, and America—each of these countries owning good native opticians—English lenses are voluntarily purchased, notwithstanding their heavy prices; and the names of Ross and Dallmeyer are synonyms for the highest excellence in lenses wherever photography is known. If this be monopoly, it is a form of monopoly upon which real progress is generally based. The best men produce the best work, and get the best prices. This has been, and will be, doubtless, to the end of time.

Mr. Aldridge's paper is well written, and its discussion will doubtless be interesting and beneficial; but as it contains, we think, some dangerous fallacies, which if accepted would be hurtful to progress, we have felt it necessary to indicate what we conceive to be distinctly erroneous conclusions.

THE INTRODUCTION OF PROTO-NITRATE OF IRON AS A DEVELOPER.

The amazingly rapid progress of photography in its earliest years was chiefly owing to the alacrity with which every experimentalist communicated the results of his experience for the guidance of his fellows. Every improvement, great and small, was unhesitatingly and freely published. Photography had scarcely become a branch of economics: it was a new art, chiefly practised by enthusiastic amateurs, and the only rewards looked for in publishing this freely were recognition and reciprocity. The time for reciprocity is passed; but it is still important that the author of each discovery, invention, and improvement in the art should retain due recognition of his work. This much is due to the experimentalist, who gave freely to the community the results of his labour. And it is also interesting to photographers to retain accurately the historic landmarks set down in the early days of their art.

This is our reason, if any excuse were wanting, for correcting an error, gaining some importance as being enunciated from the chair of a photographic meeting. Mr. Spiller, presiding at the last meeting of the South London Photographic Society, by some inadvertence fell into the error of stating that the use of proto-nitrate of iron was first introduced by the Rev. Lawson Sisson in the year 1853. This is inaccurate: proto-nitrate of iron was first introduced by Dr. Diamond at a much earlier period, the precise date of which we do not at this moment remember, not having immediate access to back volumes of "Notes and Queries," where, if we remember rightly, it was first announced. In May, 1853, the Rev. Lawson Sisson communicated to the Journal of the Photographic Society what he termed "A New Preparation of Iron for Developing Collodion Pictures." This was the proto-nitrate of iron prepared from the proto-sulphate by means of double decomposition with nitrate of lead. The Editor appends a foot-note, remarking that the solution is similar to the proto-nitrate of iron introduced previously by Dr. Diamond, who used nitrate of baryta for effecting the double decomposition, instead of the lead salt. In the August following Mr. Spiller wrote to the same journal, suggesting the use of nitrate of potash "in place of the nitrate of baryta in Dr. Diamond's formula, or the nitrate of lead recommended by Mr. Sisson." The allusion to Dr. Diamond *then* showing that the recent statement is due to a lapse of memory. In Professor Robert Hunt's "Manual of Photography" (third edition), the preface of which bears date December, 1852, Dr. Diamond's use of proto-nitrate of iron as a developer, for collodion positives yielding results of singular beauty, is spoken of as a familiar thing. Dr. Diamond was Mr. Archer's practical coadjutor in working out the collodion process, and, if we remember rightly, he tried proto-nitrate of iron as a developer amongst his earliest experiments, and we have recently seen in his possession exquisitely perfect collodion positives, with peculiarly fine metallic silver deposit of the nitrate developer, produced close upon a quarter of a century ago.

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THE PARIS PHOTOGRAPHIC EXHIBITION.

[FROM OUR SPECIAL CORRESPONDENT.]

Young Paris at the races is a different being to the Derby visitor. He is an aristocrat, and goes to see the Grand Prize run because it is fashionable so to do. While with us all London takes a holiday, from the coster in his donkey-cart to the peer in a four-in-hand, it is the well-to-do classes that make up the majority at the Longchamps racecourse. For this reason the "road home" is very different to ours. No green veils and white hats, no dolls and "fun of the fair," no pea-shooting, no shouting, no uproarious mirth; on the contrary, the Champs Elysées and the Boulevards are filled with well-dressed citizens, whose field glasses slung round the shoulder rather suggest the theatre than the racecourse as the object of their pleasure. Although the Grand Prize was largely advertised as representing "cent mille francs," there is no excitement and fuss now the race is decided, and not a single newsboy shouting the result of the contest is to be heard, nor any flaring statement of the race to be seen in the shop windows.

Everything is done orderly and methodically, and next day we read the result of the race in the papers, together with a long string of stories and anecdotes about the wonderful Kisber, and about some sanguine shopboy or anonymous workman who knew beforehand the favourite was to win, and who, in childish simplicity, staked his all upon his conviction, and is now in possession of untold gold. And this is not the only simple story we hear, for *Le Figaro*, in reporting the races, tells of a sad accident that occurred in one of the minor contests by reason of the crowd "mistaking the course," and so getting run over. We have seldom seen such a *naive* explanation put forward in downright seriousness of a shocking catastrophe, whereby a score of people were grievously wounded. It is true that lower down it is admitted there was an insufficiency of police to mark the course, but that seems to have had nothing to do with the accident.

But all this does not relate to the Paris Photographic Exhibition. True enough; but you cannot very well get there without passing the Boulevards and the Champs Elysées, where it is situated, and hence this little digression. The exhibition is the eleventh gathering organised under the direction of the French Photographic Society, and is to be found in the Palais de l'Industrie, where, our readers may remember, the International Exhibition of 1855 was held. The main part of the building is taken up by the *salon* or Royal Academy of Paris, and one may pass from the Photographic Exhibition, through a turnstile, direct into the sculpture and picture galleries. The charge for entering the exhibition is but 50 centimes instead of a franc, as was formerly the case, I remember; and for this sum the visitor not only has an extensive collection of pictures to look at, but may, if he times his visit properly, see an exhibition of lantern transparencies of a scientific and pictorial character.

I was fortunate enough on my entrance to meet M. Koziell, the Secretary of the Exhibition, and to have some conversation with him, he being so good as to point out the productions of some of the principal exhibitors. Foreign photographers were, he told me, in very weak numbers this year, but there was an unusually large number of French exhibitors; and when we mention that the highest number in the catalogue is 1,143 against about 600, which is that generally reached in London exhibitions, it will be seen that the collection of pictures altogether is a numerous one.

In one sense, the present Paris Exhibition is the finest I have ever seen; as regards scientific photography, the collection of specimens here brought together stands unrivalled. The small collection of prints and apparatus connected with photography that have been got together at South Kensington, and which form part of the International Loan Exhibition of Scientific Apparatus, are not to be compared for one instant with the complete and varied applications of photography which are here exemplified. To begin with photo-astronomy, we have pictures illustrating the Transit of Venus, M. Janssen's *revolver*, together with apparatus and illustrations sent by the observing parties who proceeded to Japan and the Island of St. Paul. We have illustrations from the Paris Observatory and from that of Kew; we have the magnificent moon photographs of Rutherford, and the former lunar pictures of Warren de la Rue; all these we may see at Paris in the present exhibition. Next, in medical science, there is a vast collection of photographs of the brain by Dr. Luys, who also shows his photo-records of the pulse. Of the greatest interest are the latter, for they tell, perhaps, more of the vitality of the human system than any other medical record. Here is the pulse of a boy five years old, beating 80 to the minute, and forming a line of sharp zigzags; here is the record of the pulse of a man in the prime of life; the pulse is slower—55 to the minute—but it beats with more vitality, and a succession of sharp-pointed spires, double as high as the zigzag marks of the boy's pulse, is the result. Then we have the man of one hundred years, whose feeble pulse gives a series of low rising curves. Dr. Ozanam, whose name is known as an early experimenter in medical photography, exhibits an apparatus termed a *pulsograph*, for taking such photographs. They are obtained, in a word, by placing a rubber bag of mercury connected with a tube upon the heart or pulse of the patient, and the rising or falling of the mercury in the tube (brought about by the pulsations) is registered by a moving sensitive plate running along behind the tube. Next we have Ducos du Hauron's results in trying to reproduce objects in colour, and following him a long list of exhibitors who have made micro-photography their study. Aimé Girard shows photographs of linen, cotton, wood, and other fibres for making paper. Delarché demonstrates how the art may be used to further botanical sciences; Ravet exhibits photographs of the phylloxera, in different phases, the tiny insect which troubles the French wine-grower so much; Fritsch shows enlarged photographs of the brains of fishes. Geridi, Jules Girard, Moitessier, Touza, and others all show what micro-photography can do now-a-days. Finally, there is M. Reynaud, who shows how flames, for lighthouses and other purposes, may be tested and registered by photography; and M. Dagron, who demonstrates the use that micro-photography can be put to in reproducing despatches, letters, documents, &c., upon so small a scale, that a pigeon may carry under its tail 100,000 messages with the greatest ease, as was indeed frequently the case during the siege of Paris, when these winged messengers were the only agents to enter the capital.

I must speak of the photographic pictures exhibited in my next letter.

A NEW METHOD OF INTENSIFYING COLLODIO-BROMIDE PLATES.

BY M. CAREY LEA.

Negatives made by any of the older forms of emulsion work will usually, if the pyroxyline have been good, yield whatever density is required by the alkaline development alone or by a redevelopment with acid silver. Once fixed and dried, however, the case is materially changed. If such negatives on subsequent examination be found to be less dense than desirable, it is found exceedingly difficult to intensify them, and they are, in this respect, very variable among themselves. Some, if placed in a bath of acid pyrogallol and silver, will gradually acquire density; others may remain in such a bath till it becomes muddy, or in a gallic bath for hours, and scarcely undergo any change. The worst is that such as refuse to gain density in the acid silver bath are scarcely amenable to any treatment. If they are chlorised or iodised, and then treated with potassium permanganate, this last substance has no action on them. Even Schlippe's salt acts unsatisfactorily on them; it turns the film to a dull brick-red instead of the characteristic deep scarlet, and the negative is found to have gained but little in density. Sometimes, indeed, this gain may be sufficient, but it is uncertain.

All such difficulties are got rid of at once and for all by the use of silver iodide in the emulsion, and this alone would be a sufficient reason for using it. A chloriodo-bromide emulsion plate after being fixed and dried will redevelop as easily with acid pyrogallol and silver as a wet plate. From continued experience I am convinced that silver iodide must eventually be used in all emulsions. In the meantime, however, those who still use the chloro-bromide emulsions may be glad to have a thoroughly effectual means of intensifying plates that have been washed and dried.

Amongst my plates were some negatives made several years ago, before I became acquainted with the virtues of silver iodide in emulsions, which had been placed aside unvarnished as too thin to print well, and with which I did not know what to do. Taking out one or two of them, I tried all the usual methods with no good result. I then cast about for something that would reach the case, and succeeded in finding a method more powerful than anything that has yet been tried. Under its influence the refractory negatives gave in at once, and took any amount of density that was wanted. The following is the method. It is, so far as I know, new, though in respect to intensifying processes it seems dangerous to speak too positively.

Like most other intensifying operations, it consists of two stages. The first is to act on the film with a gold solution—a plain solution of gold chloride, about a grain to the ounce. The first action of the gold solution is to blacken the surface; this blackening is so striking that when the plate is seen by reflected light it appears to have gained greatly in density, but if raised to the light it becomes at once evident that the image is thinner than before. The longer the gold solution is allowed to act, the thinner the plate becomes when looked through, and the greater will be the eventual intensification. It is most convenient to use the gold solution as a bath, and as it is not injured by use and but slightly impoverished, it can be placed aside in a vial for future use.

When it is judged that the action is sufficient (which, with a one-grain solution, will usually be in three or four minutes), the plate is to be removed, thoroughly washed under a tap, and then exposed to the action of an alkaline developer. The whole operation is, of course, carried on by daylight. In one or two minutes the action is complete, and the density is obtained.

I do not know of any method of intensifying which is equal in power or certainty to this. If the gold solution be used stronger, or—if of the above strength—it be allowed to use its full action, the intensification will be so very great that the plate will be rendered useless by excessive density. This effect can be produced by a single operation upon a very thin negative. It is easy, however, to graduate the effect by using the gold solution of the above-mentioned strength, and regulating the time of action. An opinion may also be formed by the appearance of the plate. If the gold solution be allowed to complete its action, then the back of the film, seen by reflected light through the glass, will be black. The action of the gold should, therefore, be stopped before this effect is reached, and while the under side of the film is still grey.

I was led to try this method by recollecting that when a gold chloride solution is dropped into one of silver nitrate there results, instead of the white precipitate of silver chloride produced by most other soluble chlorides, a yellow one of silver auro-chloride. I concluded, therefore, that if the negative were treated with gold chloride the first effect would be to convert a portion of silver to chloride, depositing at the same time reduced gold. The next action would be a combination of another portion of gold chloride with the silver chloride formed; then the application of a powerful reducing agent would convert the gold chloride so fixed into metallic gold, and also, in the presence of daylight, the silver chloride into subchloride, The result is that we gain two distinct portions of gold and recover the silver. The advantages are, therefore, that the method gives almost any degree of strength that may be desired, can easily be regulated, and that the affinities brought into play are so powerful that even the most intractable plates are subdued. I need scarcely repeat, however, that it is much better to get rid of all that class of plates, and make use of chloriodo-bromide plates, which need no such treatment, getting rid, at the same time, of backing, blisters, and all the troubles that belong especially to silver bromide when used in the absence of silver iodide.

SOME PRACTICAL HINTS ON CARBON PRINTING.

BY P. BAUM.

THE DEVELOPMENT, TRANSFER, AND FINISH.

To get the most certain and best results the prints should be developed as soon as printed, as the action of the light on the tissue continues even in the dark, but not to any great degree. Should it be inconvenient to develop immediately, it will be a wise precaution to rather under-expose the first prints done in the morning, and develop in the afternoon or evening. In the case of enlargements, I prefer the large negative reversed, and develop on the single transfer paper to remain permanently. As these generally require a good deal of working-up before sending out, the single transfer is the best, as it is easier to work upon with the brush, and the surface is a very good one, being matt in the lighter portions, with the shadows a little more glazed, and rendered more luminous from the greater thickness of the pigment on those parts. For pictures to be mounted and rolled in the usual way, nothing is more suitable than Sawyer's flexible support. It is very simple to use, but I need not here explain it, as directions are sent with the material by the Autotype Company. The single transfer paper has merely to be cut any size larger than the tissue to be developed, which is put in cold water until it is quite limp and goes straight, but before the edges curl outwards, and brought into contact under water with the transfer paper (which has been previously put in cold water for a few minutes or any length of time), and lifted out quickly, the squeegee applied, and left to set for about ten minutes, when it is developed in water at about 100° Fah.

When the finished picture is intended to retain a glass, as in Lambertype and Chromotype, the development must take place on a glossy surface, but as the process is sufficiently described to licencees, I need not here detail it, but content myself with pointing out a few matters in which the manipulation can be simplified.

In developing cartes for Chromotype, it would cost too much time and trouble to do each one separately, as they should be done, however; at all events, beginners should not attempt to do more than one or two on each plate, as the difficulty is multiplied with the number. The hands should be very clean and free from any grease, as touching the tissue with greasy fingers will repel the water and infallibly cause air-bubbles, which effectually spoil the print. Six cartes with name and address can easily be developed on a 12 by 10 plate, and after some experience and great care eight can be done. Care must be taken not to put the pieces of tissue on the collodionized plate before they are stretched quite flat in the cold water, otherwise they will stretch when on the plate, and cause air-bubbles and other defects. On the other hand, it is fatal to leave them in the water too long (until the edges curl outwards) as they will in that state refuse to adhere, which will be the case in a very few minutes, hence the difficulty of developing several on one plate. On this subject I find an article by Dr. Liesegang in the NEWS of May 19, stating that the pieces of tissue may, with great benefit, be left in the water for an indefinite time. My experience has been directly contrary to this, and since reading it, I have tried again, but with the most signal failure. I should like to hear if others have found it possible, as it would be a wonderful assistance in many respects. I can only conclude that Dr. Liesegang's experience must have been with the special tissue.

Now supposing a number of cartes placed safely upon one plate, and developed, it will be seen how important it is to have all the proofs printed evenly. In carbon printing there is much greater latitude allowed for varying depth than in the case of silver, for it is easy to stop the development of an under-exposed print, or to go on with cold water, and *vice versa* with over printed copies; but where several are developed on one plate, unless they should all happen to suffer from the same defect in the same degree, it is evident that any special efforts can only be applied to the whole of the plate, and that some must be sacrificed.

The development finished, and the plate passed through the alum, wash well, and take care that no specks of dirt, &c., remain on the plate, and apply *immediately* under clean cold water, the pieces of double transfer paper, cut rather smaller than the plate, and previously soaked from five minutes to an indefinite time in cold water. The usual way is to let the plate dry first (during which it is of course at liberty to take up and retain an indefinite quantity of dust, which cannot afterwards be removed), soak the paper in hot water, and act as above. By applying the transfer paper immediately, it saves the loss of time, which if the development takes place in the evening, means leaving the transfer paper to be put on the next day. Care must be taken to put the transfer on at once in the proper position, and to avoid shifting it about while on the plate, and holding one end, squeegee evenly and firmly. Should any dust be under the paper, it can be taken off again, and the objectionable part rubbed away with a tuft of cotton wool.

After allowing to set for about half an hour, starch the back of the prints (of course whilst still on the glass), and, looking through to see the position of the print, apply the mounting cards, pressing each one firmly down, and after leaving under pressure for a few minutes, place in an airy place for the night. The next morning your prints will come off the glass, and when the edges that project over the mount have been cut, the picture will be ready to deliver. The starch must be of a good thickness and well made, and not sparingly used; all the portions must be well covered, and the mounts firmly pressed down in every part. Glue may be used, but it is such dirty stuff, and must always be warmed; also a mixture of gelatine and arrowroot, but this must be used warm as well. I have tried a great variety of mounting materials, but nothing, I find, is so simple and effectual as the starch.

I have here made no provision for spotting the cartes; the best way of doing this is to take negatives that do not require any spotting; where, however, it is unavoidable, the prints after development must be left to dry, and the spotting done with oil or albumen colours, lead pencil, or pigment powder.

I prefer to use plain glass to develop upon; it is cheaper, and has a better surface than the back of the opal glass generally has. It is not so easy to watch the development at first, as it can only be ascertained by looking through, but one soon gets used to that. I must not omit to mention that the plates (or prints in the case of single transfer) must be kept nearly constantly moving while in the hot water, as a number of pinholes otherwise get formed, quite fatal to the prints; the utmost time any plate should be kept stationary is about two minutes.

In making carbon transparencies, the tissue should be printed nearly twice as deeply, a substratum of gelatine rendered insoluble in chrome-alum being used. If this is not handy, an ordinary albumenized plate may be used after having been plunged into alcohol for a few minutes and washed. Collodion should never be used as a substratum; it enlarges badly.

ERRATA.—Page 272, seventh line from the bottom, read "French" instead of "fresh." Page 273, thirteenth line from the top, read "expanse" instead of "exposure."

Correspondence.

CELESTIAL PHOTOGRAPHY.

SIR,—Being anxious to try some celestial photography, I shall be much obliged if you or any of your correspondents can tell me—1. If there is any process more sensitive than the ordinary wet collodion for photographing the moon, and what is the usual exposure, using a telescope of 6in. diameter, and a power of 50 or 100. 2. If Venus or Jupiter has ever been photographed, and by what process and what exposure.—I am, sir, your obedient servant,

Harrow-on the Hill, June 8th. J. Cockburn.

[There is no process more sensitive and trustworthy than wet collodion. Can any of our correspondents give the information required as to exposure, &c.?—Ed.]

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Proceedings of Societies.

Photographic Society of Great Britain.

The last meeting of the present session was held on the evening of June 13th, Mr. J. Glaisher, F.R.S., in the chair. The minutes of a previous meeting having been read and confirmed,

Col. **Stuart Wortley** read a paper describing some recent experiments with collodion and gelatine emulsions, and pellicle negatives made by means of such emulsions. He exhibited examples of the emulsions and pellicle in various stages, and some excellent negatives produced therewith, and also a developing holder permitting development in open daylight.

Mr. **Kennett**, at the invitation of the President, exhibited some fine prints made from gelatine pellicle negatives, and also made some remarks. He should like, in the first place, to ask Col. Wortley where it was stated that Mr. Johnston, to whom he had referred, had ever made a pellicle at all?

Col. **Wortley** said, in the *British Journal*, six days before the date of Mr. Kennett's patent, Mr. Johnston had given instructions how to make a gelatine emulsion: to pour it into a dish, to cut it into shreds by means of a glass rod, and then to wash it.

Mr. **Kennett** said there were no instructions for drying it and making a pellicle.

Col. **Wortley** said if the washed emulsion were left three days it would dry, and become a pellicle.

Mr. **Kennett**: It would not do so if left three days or even three weeks. Col. Wortley's object seemed to be to make out that his (Mr. Kennett's) patent was not valid. A simple course would be to infringe it, and try.

Col. **Wortley** asked for the protection of the chair against such remarks.

The **Chairman** said that the discussion of patent law, or of the validity of individual patents, was not within their province. He would call the attention of members to the very fine specimens Mr. Kennett exhibited, and ask Mr. Kennett if he had any information to give in relation to their production. The clouds were very perfect, and would be very fine, if they had been produced in wet collodion.

Mr. **Kennett** said they were produced on plates prepared with his pellicle in the usual way, and exposed instantaneously.

Some further conversational discussion between Col. Wortley and Mr. Kennett followed; the first gentleman protested against a secret process sold for trade purposes being brought before the meeting, and the second stating that as his process had been challenged, he simply wished to set himself right with the meeting. Cries of "order" and "chair" ensued, and the Chairman again said they could not discuss patent rights at that meeting.

Some conversational discussion on the protection and other manipulatory points of gelatine and pellicle negatives followed, in which Mr. Blanchard, Mr. Davis, Mr. Warnerke, Mr. Spiller, and Col. Wortley took part.

Col. **Wortley**, in answer to a question as to the relative sensitiveness of these plates and wet plates, said he had not tried them comparatively against wet plates. He then added, as the methods he had described were quite untrammelled, he hoped they would be carefully tried, and if any one wished to take them up commercially, he would undertake to guarantee any one from all risk on the score of infringing any patent.

A letter from Mr. Brooke, of Redford, was read by Mr. Spiller, describing the exposure of a dry plate supplied by Dr. Hill Norris fifteen years ago, which yielded a good negative.

Herr **Warnerke** then read a paper on "A New System of Producing Large Panoramic Photographic Negatives in an Ordinary Camera." He showed a number of fine examples in the form of pellicle negatives and prints, and described the mode of manipulating with a continuous length of sensitive tissue on rollers. This paper in our next.

Mr. **Spiller** read a portion of a communication from Captain Waterhouse describing the results of experience which tended to confirm Dr. Vogel's theory as to extending the spectrum obtained in bromide of silver by the addition of colours. Details in our next. He read details of some experience in intensifying.

The **Chairman** reminded members that the exhibition would open on the 8th of September, and adjourned the meeting of the Society until that date.

The proceedings then terminated.

South London Photographic Society.

The last meeting of the present session of the South London Society was held on the 8th inst., Mr. John Spiller, F.C.S., in the chair. The minutes having been read and confirmed, Mr. Henry Abenheim was elected a member of the Society.

Some fine examples of carbon printing by the "Chromotype" process, produced by the Autotype Company and others, was shown by Mr. Foxlee, and excited much admiration generally.

Mr. **William Brooks** read a paper entitled "Further Experience with Collocine" (see page 277).

The Chairman, referring to proto-nitrate of iron as a developer, remarked that, in 1853, the Rev. Mr. Sisson first* introduced nitrate of iron as a developer, formed by the admixture of nitrate of lead and protosulphate of iron, the insoluble sulphate of lead formed by the decomposition being removed by filtration. A little later it struck him (the Chairman) that this was a somewhat round-about method of proceeding, and that the addition of ordinary saltpetre would answer equally well, and experience confirmed this. It must be borne in mind that there was also present in solution the sulphate of potash as well as the nitrate of iron arising from the reaction, but this did not exercise any hurtful influence.

Mr. **York** did not agree with Mr. Brooks in his estimate of the developer. He exhibited a picture one-half of which had been developed by the ordinary acetic acid developer, and the other half by the new one, and he observed that the former was superior to the latter. He was not alone in this experience, for two other gentlemen, Mr. Day and Mr. King, had found the same thing; nor had he confined himself to one sample of collocine, as he had tried three different samples. He found, however, that when a minute portion was mixed with the ordinary developer it acted beneficially, giving clean pictures.

Mr. **Wilkinson** said he had been using it from the time of its introduction, and found it better than anything they had yet used. They used it in a form more diluted than that recommended by Mr. Brooks.

After some desultory conversation on the precipitation produced in the developer prepared with collocine, several members giving their experience,

Mr. **Cowan** said the developer acted so cleanly, giving such fine negatives, without shortening the exposure, that he should not like to go back to give it up for the old system of developing. With regard to the precipitate, it was filtered out day after day, if requisite, without producing any injury in the developer.

Mr. **Warnerke** still retained his favourable opinion, and said he found that the developer improved by keeping.

Mr. **Hart**, who had had considerable experience with it, foreseeing that photographers were likely to add too much, manufactured the article so that any slight error in mixing should be a minimum. He found, as a general rule, those who tried it liked it.

A conversation here ensued on the effect of using pure or common sulphate of iron and of weak sulphuric acid, and the probable influence that might be exercised by the presence of the sulphate of zinc in the developer.

Mr. **Burton** believed that sulphate of zinc had a great deal to do with the effect produced, and intended making special experiments to test the question. In using the collo-developer he noticed that the image flashed out very quickly, although the shadows came slowly, and gave great delicacy.

Mr. **Pearsall** remarked that it should be remembered that the proto-salts of iron were, when pure, of a light bluish colour, and that the per-salts were uncrystallizable. Some years ago the sesquioxide of iron had been frequently talked of for medicinal use. As the ordinary sulphate of iron was distinguished for being green, it was a fair presumption that this contained another oxide—the sesqui or deut-oxide of iron, and he thought attention to these states of iron would do much to reconcile differences in practice of practical men.

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* There is a slight error here; see leader.

Some further conversation ensued, and after a vote of thanks to Mr. Brooks, the subject terminated.

Herr **Warnerke** then exhibited some panoramic negatives, made on his sensitive pellicle, and also prints therefrom. He also explained the mode of producing panoramic effects upon lengths of his sensitive pellicle.

Mr. **Aldridge** then read a paper on "Obstacles to Photographic Progress" (see page 278).

Owing to the lateness of the hour, the discussion on the paper was deferred till a future occasion.

The proceedings then terminated.

Edinburgh Photographic Society.

An ordinary meeting of this Society was held in the usual place on the evening of Wednesday, the 7th inst., the President Dr. **Thompson**, in the chair.

The minutes of previous ordinary and out-door meetings were read and approved, and then Mr. R. H. Bow read a paper on "Small Scale Maps for Tourists" (see page 279), illustrated by a large number of specimens of various degrees of reduction, both by direct photography and by various photo-mechanical processes.

The **President** said that he had often experienced the difficulties described by Mr. Bow, in consulting the ordinary folding tourists' maps, and was certain that if accurate and legible reductions were introduced commercially, they would become popular. In producing the reduced negative it was a question of much importance how best to get sufficient density with the necessary clearness of lines. In enlarging, the amount of light on the object being copied was spread over the whole of the surface to be impressed, and was consequently feebler in proportion to the extent of enlargement; while in reducing, the light was intensified in the same proportion. In this way it was not so difficult to get an intense negative, and in his own practice, when his bath and collodion were in the best order, he often got sufficient intensity by simple iron development. When that failed he always succeeded by preparing a beer and albumen plate in the ordinary way and exposing it while wet. In this, perfect opacity was readily obtained, although it was sometimes necessary to clear the lines by a slight wash with a solution of iodine in potassium iodide, followed by a wash of weak potassium cyanide. He would be glad if those members who had much experience in that kind of work would state their experience as to the best way to get satisfactory negatives of printed matter.

Mr. **Davies** said that in his day he had done a good deal of that kind of work, and the result of his experience was that intensification with pyrogallic acid and silver was of no use. The aim of the photographer should be to get an even but solid deposit of metallic silver, and then to change the colour of that by mercury and ammonium sulphide, Schlippes salt, or other of the well-known ways.

Mr. **Pringle** said Mr. Bow had started a question of much interest to photographers, far beyond that of the reduction of maps. The preparation of small negatives for enlargement was becoming daily a more and more important branch of photographic business, and while one professional enlarger wanted thin negatives full of detail, another, in equally extensive practice, said they should be developed up to full to printing density. In the latter case he thought it not unlikely that, as so well shown by Mr. Bow, some of the finer lines and much of the delicate half tone might be sacrificed.

Mr. **Turnbull** said that for line work perfect clearness of the blacks was essential, but that he had never found much difficulty in producing good results. A thick collodion and a weak developer were necessary, and the exposure should be short. The developer should be washed off as soon as the image was well out, and the deposit blackened by a wash of mercury bichloride, followed by a wash of ammonium sulphide. If after the iron is removed, and previous to the application of the mercury, the image be too thin, it may be intensified with pyrogallic acid, to which has been added a much larger than usual proportion of silver. This should, however, be only allowed to act for a very short time, or filling up of the finer lines may be the result.

Mr. **Moffat**, in reply to a question by the President, said that he had not done much in reductions, but that in ordinary copies from manuscript he found the most successful way was to give a short exposure, and trust to the action of mercury for sufficient intensity.

Mr. Ross thought that the general tone of the discussion showed that ordinary wet collodion was apt to give obscured fine lines in the kind of work recommended in Mr. Bow's paper, and suggested the use of dry albumen plates as likely to give a finer deposit.

Dr. John **Nicol** agreed with Mr. Ross in thinking that a dry film was more likely to answer the desired purpose than a wet one. He had recently had occasion to make a microscopic observation of a number of films, the result of which proved what had long been said, that that produced on a collodio-bromide emulsion plate by alkaline development was finer than by any other process, gelatine perhaps excepted, and appeared, under a high power, simply as a stain. On such a film, especially if the bromide was slightly in excess, any amount of density could be readily got, and therefore he thought a collodio-bromide emulsion would answer admirably.

Mr. **Turnbull** had heard the same claim made on behalf of collodio-bromide before, but he thought it could hardly be sustained. He had recently had it as well as beer and albumen, and wet collodion films under the microscope, and could see no difference between any of them.

A number of pictures were then handed round by the President, Mr. Sinclair, Mr. Panton, Mr. Crighton, Dr. Nicol, &c., principally the results of the last out-door meeting, most of which were much admired, and after a vote of thanks to Mr. Bow, the meeting adjourned for a fortnight, when the council will bring up their report regarding the forthcoming exhibition.

Talk in the Studio.

Obituary.—We learn with regret of the death of Mr. William Perrin, a skilful practical photographer, with whose occasional contributions to the Photographic News and the Year-Book our readers are familiar.

Alleged Fraud in a Photo-Engraving Establishment.—At Wandsworth Police Court, Mr. John Henry Banks, of Lavender Road, Battersea, appeared to answer an adjourned summons for obtaining money belonging to "Banks and Co. (Limited)," by false pretences. Mr. Castle conducted the prosecution; Mr. Lyon was for the defendant. It appeared that the company was formed for the production of photographic blocks to supersede wood engraving, the defendant, the original owner of the patent, being appointed the manager at a salary of £300 a year. The company was recently in liquidation, and had since been registered as "John Banks and Co." An inquiry was held, and the secretary was instructed to suspend the defendant, who had a claim upon the company for wages amounting to £60. It was alleged that the defendant charged the company a higher sum for the purchase of lead than that which he actually paid; also for the purchase of cameras, and had a chest of drawers made out of cedar wood on the premises, for his own private use, the man's labour being paid by the company. Mr. Ingham pointed out that it was necessary that the true relation between the parties should be established. At present he did not know whether the money he had been paid formed wages or part of the profits. Mr. Castle then produced secondary evidence of the engagement as manager. In reply to the magistrate, the defendant simply denied the charge. Mr. Ingham committed him for trial, accepting bail.

Improved Process for Silvering Glass.—Up to 1840 mirrors were silvered exclusively by means of an amalgam, a process most destructive to the workmen employed. An important step was effected by an English chemist, Drayton, who conceived the idea of coating mirrors with a thin layer of silver, obtained by reducing an ammoniacal solution of nitrate of silver by means of highly oxidisable essential oils. This process was subsequently modified by several chemists, but only became really practical when M. Petitjean substituted tartaric acid for the reducing agents formerly employed. The glass to be silvered is laid upon a horizontal cast-iron table heated to 104° Fah. The surface is well cleaned, and solutions of silver and of tartaric acid, suitably diluted, are poured upon it. The liquid, in consequence of a well-known effect of capillarity, does not flow over the edges, forming a layer a fraction of an inch in thickness. In twenty minutes the silver begins to be deposited on the glass, and in an hour and a quarter the process is complete. The liquid is poured off, the glass washed with distilled water, dried, and covered with a varnish to preserve the silver from friction. The advantages are evident. Mercury, with its sanitary evils, is suppressed; there is a gain in point of cost, as 60 to 75 grains of silver, costing about 20 cents, suffice for 10·75 square feet, which, under the old system, would require 1½lbs. of tin and the same weight of mercury. A few hours suffice to finish a glass on the new system, while the old process required twelve days as a minimum. On the other hand, the glasses thus silvered have a more yellowish tint; portions of the pellicle of silver sometimes become detached, especially if exposed to the direct action of the sun; and despite the protecting varnish, the silver is sometimes blackened by sulphuretted hydrogen. M. Lenoir has happily succeeded in overcoming these defects by a process alike simple and free from objections on sanitary grounds. The glass, silvered as above, is washed, and then sprinkled with a dilute solution of the double cyanide of mercury and potassium. The silver displaces a part of the mercury and enters into solution, while the rest of the silver forms an amalgam, whiter and much more adhesive to glass than pure silver. The transformation is instantaneous. The amount of mercury fixed does not exceed 5 to 6 per cent. The glass thus prepared is free from the yellowish tint of pure silver. It is also less attacked by sulphur vapours and the rays of the sun, in which last respect it is superior to mirrors silvered by the old process.—*Bulletin de la Societe d'Encouragement pour l'Industrie Nationale.*

To Silver Cast Iron, 15 grains of nitrate of silver are dissolved in 250 grains of water, and 30 grains cyanide of potassium are added. When the solution is complete, the liquid is poured into 700 grains of water, wherein 15 grains of common salt have been previously dissolved. The cast iron intended to be silvered by this solution should, after having been well cleaned, be placed for a few minutes in a bath of nitric acid of 1·2 specific gravity just before being placed in the silvering fluid.—*Scientific American.*

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To Correspondents.

J. M. B.—All the negatives of the late O. G. Rejlander are in the possession of his wife, who will be happy to supply orders of either mounted or unmounted prints of his works. Her address is No. 1, Myrtle Villas, Cottage Grove, Stockwell, S.W.

A Photo.—We have no means of knowing to what extent openings exist in Australia or New Zealand for a photographer to commence business. There are generally openings in a growing colony for an enterprising and a skilful man.

Amateur.—The lighting of the head in the card portraits enclosed is not very satisfactory. A somewhat stronger direct light on one side is required to give force and relief. The bath is apparently working a little foggy, and this fact intensifies the fault of the lighting.

T. T.—The front lens of a portrait combination may be used for landscape work; but it would not answer well for architectural subjects, and would be worse still for copying, on account of distortion. On the whole, we should be disposed to recommend No. 2 of your list as the most useful for all purposes. It is very difficult to speak of relative rapidity, as so many circumstances modify this. Possibly No. 2 would be three or four times less rapid than a portrait combination; but this entirely depends on the size of stop required for each.

J. H. W.—As portraits taken in an ordinary well-lighted sitting room and in the open air, the examples you send us are very satisfactory indeed. It is difficult, without the complete control over the arrangement of light and shadow which a good studio gives, to secure all the modelling and force combined with delicacy which may be desirable; but you have approached very near to this. The single figure (portrait of a lady) is exceedingly delicate and harmonious indeed; the only improvement might be a little more force. The group of two is also very good. The portrait of a child is a little "spotty," in an artistic sense, from the darkness of the background and chair, and lightness of the figure. The white line round the chair interferes very much with harmony and repose. The landscapes sent are excellent. We have not seen a finer photograph of the Chateau of Chillon. Your success is manifestly due to great care, precision, and taste. Thanks for the outline of your mode of working, which we shall publish in our next.

S. E. W.—The milky effect of which you complain in your enamelling collodion may arise from either of two causes. It is frequently due to the quality of the pyroxyline employed, and not unfrequently due to the use of insufficiently rectified solvents; that is, the ether and alcohol contain too much water. There is no remedy in either case.

Improver.—The examples you enclose are not bad, but they might be improved. You have apparently a little too much diffused light in the studio. There is a want of concentration in the light, by which points of high light would be indicated and better modelling secured. A little more intensity in the negative is desirable, which might possibly be obtained by carrying the development a little further. Avoid cyanide for fixing. It is dangerous, and probably makes your negative a little thinner. Use hyposulphite of soda.

F. M. L.—It is possible to produce transparencies on wet plates by contact-printing, using the light of a gas flame. Place a strip of card at each end of the negative o prevent actual contact between the wet sensitive plate and the negative; expose for about half a minute, more or less, according to the density of the negative and intensity of the light; develop with iron as usual.

G. D.—The addition of a little salycic acid to gum or glue will prevent moulding and decomposition.

Received.—Examples of phototint mechanical printing from Messrs. B. J. Edwards & Co.; A new edition of the Autotype Company's Manual; British Manufacturing Industries, edited by Philip Bevan.

Several correspondents in our next.

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METEOROLOGICAL REPORT FOR MAY.

BY WILLIAM HENRY WATSON, F.C.S., F.M.S.

Observations taken at Braystones, near Whitehaven, 36 feet above sea-level.

N.B. The barometric readings given in this and former reports have not been reduced to the sea level.

Date.	Barometric Pressure. Morning	Noon.	Night.	Temperature. Morning	Noon.	Night.	Direction of Wind at 9 a.m.	REMARKS.
1	29·50	29·56	29·70	41°	46°	40°	S.W.	A little rain a.m. and p.m.
2	29 78	29·88	29·9[illegible]	46		40·5	S.W.	A few drops of rain this morning
3	29·97	29·99	30·10	42	56	39	N.W.	Fair, but gloomy
4	30·12	30·14	30·12	46·5	56	46	N.	Fair and sunny
5	30·10	30·00	29·96	48	60	44	N.	Fair and sunny
6	29·95	29·90	29 90	50	60	50	N.E.	Fair, generally sunny
7	30·00	30·10	30·17	48	54	46	N.E.	Fair, generally sunny
8	30·20	30·20	30·12	50	57	44	E.N.E.	Fair, but gloomy
9	30·10	30·00	29·97	44	54	41	N.	Fair, generally gloomy
10	29·92	29·00	29·96	44	54	46	N.N.E.	Fair and bright
11	29·98	29·98	—	44	56	46	N.	Fair, bright, and clear
12	—	—	30·00	46	57	44	N.W.	Fair and bright
13	30·04	30·00	29·98	46	56	46	W.N.W.	A little rain this afternoon
14	29·87	29·82	29·80	48	55	45	W.	Fair, but gloomy
15	29·80	29·86	29 90	46	54	46	N.W.	Fair and sunny
16	29·92	29·94	29·97	47	50	47	N.W.	Fair, generally sunny
17	29·99	30·01	30·03	46	51·5	48	W.	A few drops of rain p.m.
18	30·03	30·00	29·99	47	54	46	S.W.	Fair, bright, and clear
19	30·00	30·03	30·01	50	58	50	S.S.W.	Fair, bright, and clear
20	30·00	29·96	29·90	46	56	53	S.W.	Fair, bright, and clear
21	29·83	29·70	29·60	52	63	55	S.W.	Fair, occasionally sunny
22	29·50	29·37	29·37	50·5	57	51	W.	Showers a.m. and p.m.
23	29·38	29·40	29 44	50	54	50	S.W.	Showers a m. and p.m.
24	29·46	29·50	29·53	51	56	52	N.W.	A little rain this morning
25	29·58	—	29·57	47	51	50	N.	Fair, but gloomy
26	29·50	29·46	29·50	48	59	55·5	N.	Fair and sunny
27	29·57	29·62	29·81	50	59	51	N.W.	Fair and sunny
28	29·89	29·90	29·90	52·5	57	52·5	N.W.	Fair and sunny
29	29·86	29·80	29 71	56	60	54	W.	A few drops of rain this evening
30	29·72	29·76	29·80	54	60	55	W.N.W.	Fair, but gloomy
31	29·83	29·87	29·90	56	61	53	W.	Fair and bright

Summary.

	Mornings.	Noons.	Nights.
Highest temperature	56°	63°	55·5°
Lowest ditto	41	46	39
Mean ditto	45	56·1	48

Mean of all observations ... ... 49·7

Number of fair days	23
Number of days on which rain fell	8
Number of fair days, bright	17
Number of fair days, gloomy	6

Notes.—From the above it will be seen that during the month we have had a somewhat unusually large number of fair days; a large majority of these having been bright and clear, the month of May this year must have been very suitable for photographic operations. The mean temperature was 3·1° below the mean of May 1875. The rainfall only amounted to 0 35 of an inch. The scarcity of rain prevented very much the growth of the grass and other crops, while fears were entertained by many of the farmers that the crops would be "vary lae" this year. The occasional showers which we have, however, had since the commencement of the present month appear to be bringing the crops up to their usual condition at this season

Braystones, June 12th, 1876.

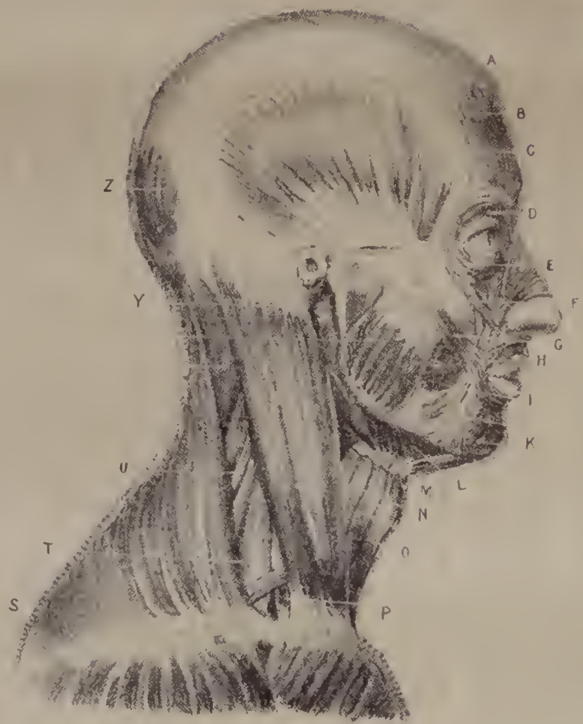
"IN PRESS TO BE READY SHORTLY."

CONCISE INSTRUCTIONS IN THE ART OF

"RETOUCHING."

BY

F. T. BURROWS AND J. D. COLTON



With Lithographic Illustrations and Negatives which may be detached & printed from as examples.

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1959

The Photographic News, June 23, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Depiction of Drapery and Portraiture.

There is one thing which particularly strikes an English photographer after looking over a lot of foreign portraits, and particularly those executed in Germany; it is the display of drapery which is seen in most of the pictures, and the artistic manner in which this is rendered. You will find that this point is attended to both in the far south, in Vienna, by such men as Fritz Luckhardt, Adele, and Heid, of Vienna; as also in the north, in Berlin, and Hamburg, by Loescher and Petsch, Haufstaengel, Bieber, and other notabilities. While we in England appear to be very anxious to take bust pictures, or merely the heads of our sitters, the German photographer in most cases seeks to take a whole picture, and generally allows plenty of room for the skirt or train of the ladies' dresses. The effective pictures of Loescher and Petsch, as of Luckhardt, although these firms may execute the most charming bust portraits, are those which make much of the pretty costumes worn at the present day, and which, under the clever handling of these German artists (if an Austrian will permit the name for once), appear always in the most graceful folds. So delicately and harmoniously rendered is the drapery at times, that one cannot help thinking that the dress must have been made up according to implicit directions given by the photographer himself to yield the best results. He has chosen, so it seems, certain shades of grey, or striped materials of a tint suitable for depiction in the camera, and has clothed his model in a way which the sun will render best. There is a sweep in the folds, as well as a fineness in the texture of the material, which bespeaks the artist, and very often a photographer pleases his customer at once by the skill in which the dress alone is treated, who would otherwise, if she were a lady of no very striking charms, give him repeated trouble. Certainly photographers in this country do not pay that attention to the drapery of the model which our friends on the Continent do, and hence we think sitters over here are more difficult to please than would otherwise be the case. Ladies have become very fastidious in their costumes and dress of late, and it is, as everybody knows, when a new garment comes home that the period of having one's portrait taken is generally fixed. If a sittter—and a lady especially—finds that her pretty new dress is gracefully pourtrayed in a photograph, that the pose is good, and that she looks like a lady, she cares very little if she has that peculiar smile upon her face, or that naive look, which she has selected on purpose from among her accomplishments as the best to assume under the circumstances Half the portraits that ladies reject and throw back upon the photographer's hands are, as all our friends know full well, disliked, not because of any fault in the face or pose, but by reason of the dress not showing to advantage, or not being sufficiently displayed. If we studied more how to represent drapery well by means of the camera in England, it would be very much to the advantage of our photographers, for nothing helps so well and so readily to make a presentable picture. Many of the German artists show almost the back of their models, the head turned a bit towards the camera, in order that the graceful folds of the dress behind may be seen—sometimes the prettiest part of the costume. Some recent pictures that we have seen show us standing models in flowing dresses, with plain backgrounds, and without the vestige of a chair or any other property. A lady standing, hardly sideways, but perhaps a quarter round, with the nearer arm akimbo and the other hand touching a locket upon her watch-chain, looking towards the camera, was one of the most easy and effective attitudes we have seen for a long time. The lady who served as model was tall and graceful, standing erect and yet without any constraint, and her dress, though somewhat plain, was exquisitely rendered both as regards its transparent texture as its pretty folds. No doubt a good deal of the credit of the portrait belonged to the lady herself, but yet the photographer must have been a very capable man to have seen his opportunity and taken advantage of it. Such pictures, to be effective, must of course be larger than carte size, and even cabinet format is a little too small. The Promenade picture, or a print ten or twelve inches high, is required in order to be able to do full justice to drapery in a portrait. We do not suppose that the work is done very easily, nor that every one who possesses a camera will be capable of producing such pictures as we refer to; but there are many capable photographers among us who do not give their attention to drapery, and yet have only to try in order to succeed in delineating it successfully in their pictures, and this is why we have thought it worth while urging the subject once more upon their attention. Three years ago there were a pair of exquisite portraits exhibited at Pall Mall by Fritz Luckhardt, which were simply studies of drapery, and so effective were they that although the lady-models were not particularly good-looking, everybody exclaimed at their grace and beauty. It is this attention to the dress of the model which renders most foreign portraits so attractive to the public, and which causes our own countrymen to cry out about the superiority of Continental photography. We commend the matter to the serious attention of British photographers.

* * *

A NOVEL SYSTEM OF PRODUCING LARGE PANORAMIC NEGATIVES BY MEANS OF ORDINARY SMALL CAMERAS AND LENSES.

BY L. WARNERKE.*

While taking negatives on my sensitive tissue in the roller dark slide, it occurred to me to utilize the peculiar advantages possessed by this method, and I submit now to your notice the result of my experiments.

To make my description intelligible, I shortly here say that the roller dark slide is the substitute for ordinary dark slide, having, instead of the usual receptacle for the glass plate, two rollers, on which an endless band of sensitive tissue is wound, an arrangement provided to expose in succession one length of it after the other in the ordinary camera. The tissue itself is flexible transparent film of collodion temporarily cemented to the paper, but detached from it after the negative is developed.

To produce a panoramic negative, I expose the sections intended to form the panorama, separately, by simply rotating the camera round its axis. Care must be taken to have the camera level, and to provide the arrangement to produce the rotation of the camera round the vertical line, passing through the centre of the lens. The lens must be of non-distorting kind, otherwise the line forming the junction between two sections of panorama will be concave on one and convex on the other, and consequently the junction impossible. The horizontal lines, through the same cause, will have the cycloidal shape on the panorama.

The exposure of every section must be strictly identical, and every such section must have a small part (a quarter of an inch) in common with neighbouring portion.

For development, the portions of the tissue containing all the panorama is developed simultaneously; by this means the intensity of all the sections will be identical.

When the film is detached from the paper, the separate sections are cut and placed on the moistened with water glass plate in respective relation to each other, which can be easily done, the tissue being quite transparent. In this stage the separate negatives will overlap each other a little. A sharp knife is now passed over the line intended for junction, and overlapping bands of the tissue removed. With ordinary care, the junction thus made will be almost imperceptible, but further operation will make it less so. For this purpose, solution of india-rubber in benzine, followed, when dry, by plain collodion with castor oil, is applied to the joined negative. This will perfectly unite all the separate sections, so that when the glass is immersed in the water, the film, bearing all the panorama, can be detached, and is, in fact, one negative.

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* Read before the Photographic Society of Great Britain.

I had occasion to form, besides others, one panorama from five sections, representing a gigantic negative thirty-two inches long, and this made by means of a seven-inch camera.

I scarcely need note here, that retouching, which is easier on the tissue than on the glass, may hide many imperfections of junction and others.

I think that I do not over-estimate the value of the power offered by this new system to the landscape photographer, especially now, when the large size of the pictures on the one hand, and the portability of the apparatus on the other, are the order of the day. By its adoption, many inconveniences of the direct large, just as well as enlarged negatives, are avoided; while some advantages are gained, not yet possessed by photographers; viz., the possibility to include any angle of view up to 360°, without sacrificing either rapidity or definition.

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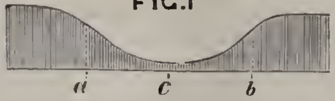
ON SMALL SCALE MAPS FOR TOURISTS.

BY R. H. BOW, C.E., F.R.S.E.*

The greatest difficulty in the way of getting good results by most of the processes arises from the tendency of the fine lines to become contracted, clouded, and choked up on pushing the development in order to get a dense negative. There seems no practical limit to the minuteness of definition in small-sized positives—that is, in very thin negatives; but when the development into a negative is proceeded with, deterioration goes on increasingly. To make this clearer and point out some of the causes of this, let us take the simple example of one fine black line upon a white ground to be photographed. The actinic impression made upon the collodion film by the exposure cannot, for several reasons, be regarded as terminating with absolute abruptness at the edges of a sharply defined representation of the line; the actinization will, as it were, be shaded off; again, even the central part of the image of the line cannot be regarded as absolutely free from actinization, since actinic light cannot be altogether excluded. In the dark room there is always some actinic light, and from the surfaces of the lenses some portion of the light will be scattered. The degree of action, latent in the film, may therefore be represented by the heights of the shaded parts in such a diagram as this:—

FIG. I



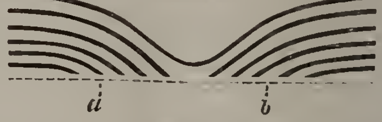
Actinization at image of a very fine line.

where *a b* is the true width of the line, magnified, it may be, one-thousand times.

Now, if the development be stopped as soon as any appreciable deposit has taken place, the image of the line may possibly be exaggerated in width; in a very thin positive it may happen to be nearly correctly given, or equal to *a b*; but on pushing the development the less actinized parts of the film begin to play their part, and the lines become narrowed more and more; and then a fog may set in at *c*, where adventitious light has alone acted.

But, over and above this, there is another cause of the closing up of the fine lines. If we examine a negative rendered dense by much development with pyrogallic acid and silver, we at once see that the deposit is of very considerable thickness. And it is obvious that this in being formed will grow not only in a vertical direction, but also laterally, and the deposited particles will gradually contract the channel representing our line, exactly as in the case of an electrotype deposit. This latter cause of deterioration is probably the most important one standing in the way of our getting a good dense negative with fine sharp lines; it would greatly reduce the evil if we could get a deposit of a more purely metallic character, so as to be of inappreciable thickness. Another mode of attacking it would be to begin by making an etched negative by tracing the map upon a sheet of glass covered with a transparent yellow coating, and from this make a reduced well-developed transparency; by this the fine lines could be exaggerated in width to allow for the opposite tendency, in the third operation, of making from this transparency the working negative.

FIG. 2



• Successive layers of the deposit resulting from the development.

However, until further light is thrown on these suggestions by experiment, the surest course to pursue in the meantime, when much reduction of scale is wanted, will be to redraw the map to be copied, in a manner sufficiently bold to meet the requirements of the intended amount of reduction. I here show a portion of the one inch ordnance map so redrawn, with a view to its reduction to a scale of ten miles to the inch, and also place before you a copper photo-relief block for surface printing, made on that reduced scale from it, by the Typographic Etching Company, of 23, Farringdon Street, London.

The one inch ordnance map itself is not, as I have said, well suited for reduction—not so much from smallness of size of the usual lettering, as from its script character and the exceeding fineness of the hair-strokes. The Typographic Etching Company have been endeavouring to reproduce a part of this map for me on a scale of three miles per inch, and I still hope they will be successful, as it would reduce the sheet to a convenient size as a two-page map; or the English half-size sheet to go upon one page—the measurement over the real map work being only six inches by four inches. That any great difficulty is experienced by them in this reduction is altogether due to the exceeding fineness of the lines is proved by the specimens of their work I have the satisfaction of laying before the society. I would especially draw attention to their copy of a page of the *Times* newspaper reduced 4·7 times in lineal dimensions, or twenty-two times in area. The smallest lettering is only about 0·0075, or at any rate less than 0·008 inch in height, and this can be read in a bright daylight by a good unaided eye that can see clearly at a distance of five inches or less.

To the Messrs. Dawson, the managers of the Typographic Etching Company, I beg leave here to express my thanks for their endeavours to carry out my notions with respect to small scale maps, and for providing me with the beautiful specimens of their work I have laid on the table for your inspection. All must admire these, and from the small charge at which they can be produced, the process must be regarded as commercially successful.

The Different Methods of Producing Reduced Copies of Maps.

I may now refer to some of the many processes by which the small scale maps may be made.

First in our list, as possessing the greatest power of minute delineation, comes the positive collodion copies taken directly from the map, and supported either upon glass, mica, or blackened plates of suitable materials, or transferred thereto.

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* Continued from page 280.

2. Collodion transparencies of a thin character taken by the reducing camera from large-sized negatives, which need not be dense. These may be transferred to suitable white mounts.

3. Silver prints on albumenized paper from dense reduced negatives.

4. The Typographic Etching Company's photo-relief block printing in ordinary printing ink.

5. Photo-lithography; as a fair specimen of this I produce the frontispiece given in Vol. III. of the *Popular Science Review* (1864); it is a copy of a page of the *Times* newspaper reduced about four times.

6. The Woodburytype; of the merits of this for very minute work I cannot speak.

7. Copper-plate printing from photo-etched plates.

The 8th and last process I have to name is that patented by Mr. Joseph Lewis, of Dublin, and the specimens I hand round were given in the *British Journal* for May 25, 1866. This is not at all a photographic method; the reduction is effected by means of the contraction of a sheet of vulcanized rubber, on which, when in a stretched state, the design has been printed in a greasy ink, after the contraction the design or print is transferred to a polished lithographic stone. Preliminary to this process we must, of course, have the subject in a printing state on the large scale.

From improvements in the production of dense negatives to give good silver prints, or by employing the collodion processes, it does not appear unreasonable to expect that the ordnance map may be reduced to a scale of four and a-half or five inches to the mile, so as to comprise in one page of portable size the sheet measuring in its original form twenty-four by eighteen inches over the real map work; or it would be possible to redraw this sheet with a bolder style of lettering without rendering it necessary to omit much of the detail, and so fit it to be reduced to the desired extent by some of the cheaper ink-printing processes.

ON THE ACTION OF THE BLUE, YELLOW, AND RED RAYS UPON THE PHOTO-SENSITIVE SURFACE.

BY THOMAS SIMS.*

There was associated with these experiments a mild kind of transubstantiation, or transmutation belief or hope that the surface molecules would become plastic enough to grow into form coincident with the degrees of refrangibility of the different colours. A hope that a photograph could be taken requiring no fixation, because it was found that fixation meant the reduction of molecular form or condition to uno or zero, and that corresponded with white and black. To fix prismatic colour, to fix the angle of a rain-cloud to the sun, and both to the angle of vision. When it was daily seen and felt that each molecular form or condition was exhibited upon the same surface within very short intervals of time, the enthusiast may be forgiven. The facts, however, remain, and white and black, or monochrome. It is clear that the white and black of the Daguerreotype is simply the molecular difference of two metals, and that each in its turn may be black, white, yellow, or red; but once we speak of them as fixed colours, they are no longer simple metallic elements. The silver image on paper may be of such a metallic whiteness as to be invisible, while the white mercury image of the Daguerreotype is black when put upon paper. Good velvet pile is equivalent to darkness, both as regards the eye and the photo-chemical surface as long as the pile is perpendicular to the plane of the surface upon which it rests; but place it at an angle of reflection, or hot-press a portion of the pile in one direction, and we have white; but if we would convert the mercury into one of the elements of flesh-colour, we must turn it into vermilion; that would be so far a step. We could also turn the mercury into the iodide of mercury, and get the bright scarlet of an officer's coat; but then an officer's coat holds all the actinic rays in its meshes, and the plate gets none; and where is our mercury to come from? Very inconvenient. So the silver and iron deposited in the collodion positive may, with great ease, be turned over, after fixation, into permanent yellow, red, blue, or purple; but they are not so true in gradation as black and white, for if we alter the collodion-photo. impression of a red-brick house into the red chromate of silver, the mortar between the bricks is red, the bricks are black, and in any other case the colours are not correlated to those of nature.

Party-colour in plants and flowers seems to be the result of a gradual conforming of the ultimate molecules of chlorophyl (using the term to signify those peculiar elements that take any colour as well as green) to the waves of vibration of the different colours, the normal colour of young buds being generally pale yellow. It is not done in a second or two. Nature does it calmly, slowly; it is life and growth conforming to pre-ordained beauty. To make it of practical use the artist must eliminate the element of nature's time in the same degree; therefore in that respect excel nature in her most beautiful achievement. It is true that even in temporal things we know not what we shall be. If transmutation is not possible, man as well as other portions of creation exhibit allotropic phenomenon, and it is possible that some humble, hard-working student may be given a chance to a practical solution of the riddle. When he does, it will revolutionize our present knowledge of photo-chemical relations to light, heat, and electricity.

I have in the above short account tried to place before the reader the relations of unfixed colour to photography. They are not without importance to other branches of art. There has recently been propounded, and practised, the plan of adding colour to the sensititive colodionized film for the purpose of extending the sensitiveness of the preparation to the same colour.

The first objection is, that for scientific accuracy, the collodion process is not only too sensitive to meteorlogical changes, but that the bath of nitrate of silver used for sensitising becomes so complicated in its chemical contents by the mere use, that it is very difficult to state, if any unique phenomenon occurred, what were the chemical conditions which produced them; to add a fixed colour to such uncertainty is to add a compound of sometimes two, three, or more elements, of which it is equally difficult to state with accuracy the mode in which they act upon each other. How, then, is the action of the whole to be formulated? Some may say, Never mind the formula, provided we have the results. I reply, that results of the kind are very little use unless we know how to reproduce them.

Every fixed colour, whether a natural production or manufactured, is compounded of the colouring matter and a base, and before we could get a formula of use in photography it would be necessary to know whether the colouring matter or the base were the active agent. In some cases the colouring matter, combines with the base in two or three different proportions. In the operation of dyeing the base must have two affinities, one for the fabric, and one for the colouring matter. This must be borne in mind in dyeing collodion photographs after fixation. Ultimate atoms of colouring matter must coincide in some important degree to the wave lengths of the refrangibility of the undulatory theory, and in an electro-negative state to which the base is positive, or *vice versa*, the compound result must be a permanent polarisation of the direction of the atoms one to another, and to the light. The base of one colour is the colouring matter of another, so that the positive and negative condition is only relative. Thus logwood is not only a useful colouring matter, but makes a good developing solution for collodion impressions, but the ordinary iron developer forms a very good base to logwood, and yet iron solutions form with other bases the colouring matter for blue, yellow, and red. (I have never used logwood as an actinizer, but believe it would prove a good one.) At any rate, it is a proof of indefiniteness when we can speak of colour as a developer, and a base as a developer, in regard to the very same operation. These curious facts lead to the question, What is the mode by which the developer continues the operation of the light? Its presence alone seems sufficient. It seems to be a means of conveyance and introduction of the silver particles to those parts of the plates to which they are attracted through the initiative power of the actinic rays. Iron does not, as far as I can trace, combine with the collodion positive image, and, although I have passed many hundreds of impressions through every degree of heat up to the point at which glass begins to melt, I have never been able to see a trace. So I conclude there is no combination, and what remains in any case through careless washing spoiled the impression, because a trace of hyposulphite would also remain and turn the whole black. Upon these grounds, I think the evidence goes to show that the developing solution affords electro-chemical conditions, but does not enter into combination; and because in its thus acting the analogy holds good between the wet collodion and kindred processes and the dry Daguerreotype. In both, the light initiates a definite amount of magnetic force, which attracts a definite quantity of some specific element, and no more; and everything else being equal, whatever deposit obtains more than this is due to other causes than the action of light.

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* Continued from page 281.

For the purpose of scientific observation, I would recommend something analogous to Daguerreotype. Many of the annoyances were occasioned by the plate so rapidly radiating its heat, and condensing moisture. Well-rolled paper or cardboard japanned would be better when well silvered and polished by machinery, and there would be no need to attempt to use it twice if an impression failed. It could be stored and reduced. After fixation, the impression should be fastened with the vapour of a suitable varnish—a mere breath of it is sufficient—and would be as quickly dried. For microscopic and telescopic observation, the impression could be made without any texture except that given by the object, which for enlargement afterwards would be of great value. I do not think that what may be done by the vapour mode of operation is sufficiently known or thought of in regard to science and scientific records.

◆

GELATINO-BROMIDE PROCESS.

BY G. W. HEWITT.*

Having recently made a somewhat extended series of experiments as to the capabilities of the gelatino-bromide process, and having found it a really valuable one, I desire to call the attention of the members present to a few negatives for critical examination, and also to lay before them the method of working I have found to be most certain, and which gave the best results in my hands. I cannot say that I have thoroughly tested this process, as I have yet to try it in the heat of the summer months, which trial, I think, will be the most severe, but up to the present time my experience has been most satisfactory.

In order to insure the successful working, I have found the following most important, and the neglect of which will, I think, invariably result in failure: a chemically clean plate, rapid drying, and proper thickness of film. As to the material, I find Nelson's ordinary gelatine, that used for jellies, &c., answers all purposes, and my experience has been that, should failure occur, the cause need not be looked for in that direction.

My method of preparing the plate is as follows:—Clean first with acid, then with tripoli and water, with a little alcohol; this seems to give a fine grain to the glass surface, which I think assists the adherence of gelatine. After rubbing off the tripoli, dry, polish with a few drops of alcohol and ammonia (equal parts), applied with a piece of clean flannel. I will describe the making of two ounces of finished emulsion:—

Place in a four-ounce bottle thirty-six grains of gelatine, and add about two ounces of water; after two or three hours pour off the water as closely as possible; place the bottle in a dish of warm water, and add half an ounce of distilled water, and thirty-six grains of bromide of potassium. While the gelatine and bromide salts are coming in solution, dissolve fifty grains nitrate of silver in six drachms of water (distilled), and place it in the dish to become slightly heated; then, in non-actinic light, add the silver in four portions to the bromised gelatine, shaking well after each addition. I then place the bottle in a small pasteboard box, light-tight, near a flue or in a warm place, and leave it for eight or ten hours, or over night. Add to it then sufficient distilled water to make up two ounces; heat it, if necessary, in a hot water bath, to render it perfectly fluid, and dialyse it for four or five hours; the dialyser is, as you see, simply a tumbler with the bottom cut off. The parchment paper is first wet, and then stretched over and secured by a gum-band; the three supports are attached by another band; this is placed in a shallow dish, and warm water poured in until it touches the whole surface of the parchment floor, the dish being supported over a Bunsen burner, turned down quite low, as it is only necessary to keep the water just tepid; the gelatine is then poured in, and left to dialyse. At the expiration of the time above mentioned it is filtered through four thicknesses of papier-Joseph, and is then in condition to coat the plates, or may be set aside in a cool place to be used within a few days.

To coat the plate requires a little dexterity. I have succeeded best in the following way:—Warm the plate over an Argand burner (a non-actinic one); take it with your pneumatic holder, and pour on a pool of gelatine as you would collodion; bring it down (after covering the off corners of the plate) slowly, guiding the edge with the lip of the beaker from which the gelatine is poured, by humouring it a little, and you may take your time; the plate will be easily covered; drain it as you would a collodion plate, but not so closely, and place in on a perfectly horizontal shelf to set, which it will do in about ten minutes. The quantity above taken will coat from eight to ten 4-4 plates.

To dry plates I use a cupboard, under the bottom of which is a sheet-iron drum, with opening for the supply of fresh air; this is heated by a Bunsen burner, and keeps up a constant supply of warm air to the cupboard above, in which there are two shelves of plate-glass, accurately levelled, with openings at ends to allow the circulation of hot air, which, after passing over the plates, is taken off at top. The plates become thoroughly dry in from three to four hours. I have here a coated plate, which will serve as a guide for thickness of film, &c. I prefer dialysing to washing out the free salts; it is less troublesome.

As to the rapidity of these plates, they are not the most sensitive, but are fairly so. An exposure of one minute, with an F 25 stop, will be found sufficient. By increasing the proportion of silver in the emulsion they can be made as rapid as wet plates, but I prefer the formula as given. These plates will "blur," and require backing. I have reduced this defect very much by staining the film with roseaniline, without detriment to the result.

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* Read at the Photographic Society of Philadelphia.

Development.—Allow the plate to soak for at least three minutes in water; then use the alkaline developer, but flowing the plate first with the pyro and bromide, and adding the ammonia afterwards. I use the pyro dry, and not in alcoholic solution, which latter, I think, is apt to cause wrinkling of the film. The image should come up slowly; a rapid development, or forced one, is apt to produce a foggy result.

The developer I use is,—

Pyro	3 grains
Water	1 ounce
120-grain solution of bromide of potassium	1 drop
Saturated solution carbonate of ammonia	1 or 2 drops.

This will bring up the image to sufficient density in most cases; but when the image is flat and thin, I prefer to intensify with chloride of copper and alkaline pyro. The negatives, with two exceptions, were intensified in this manner. The negatives, when fixed in hypo and well washed, are allowed to dry spontaneously, and, with careful handling, can be used for printing without being varnished.

◆

ON THE PREPARATION OF SENSITIVE DRY PELLICLE FROM COLLODION AND FROM GELATINE.

BY COL. H. STUART WORTLEY.*

I propose to lay before the Photographic Society to-night the results of my work in a more or less new direction. During the past winter and spring I have been engaged in investigating the best method of making a sensitive pellicle both from collodion and gelatine, and I have further been working in the direction of making sensitive pellicular films ready for exposure in the camera, and thus doing away with the necessity of a glass or paper support. I will make my communication as brief as I can consistently with a clear explanation of what I wish to bring before you, and will begin by describing my method of preparing a collodion pellicle ready for exposure.

Finding a certain amount of difficulty in preparing a pellicle from what we may call an ordinary washed emulsion, I have been working of late in the following manner: I take a good sample of plain collodion, and add to it sixteen grains per ounce of bromide of cadmium dissolved in as little alcohol as will do it, and then pour out the bromized collodion into a clean glass dish for the solvents to evaporate. I make a silver bath of 120 grains of nitrate of silver and 10 grains nitrate of uranium to the ounce of water, with 1 minim per ounce of nitric acid. I then cut up into small pieces, about an inch square, the collodion from which the solvents have evaporated, and placing it in a bottle I pour in sufficient of the silver bath to cover the pieces of pellicle. The silver bath will sensitize them throughout their bulk in from twenty minutes to half an hour, depending upon the thickness of the evaporated collodion; and I take this opportunity of mentioning that the thickness which I find the best is about an eighth of an inch.

It may be said that the use of a 120-grain bath is extravagant. It is quite the reverse: 4 ounces will sensitize enough pellicle for two dozen 12 by 10 plates; and as no dirt goes in from the back of the plates, and no albumen or other deleterious substance, the 4 ounces will only want strengthening before being used again.

I show pieces of the unsensitized collodion; and in this bottle you will see pieces of the sensitized material immediately after sensitizing, while in the third bottle is the pellicle after being dried.

When the collodion is thoroughly sensitized the whole is turned out of the bottle into one of the little porcelain capsules, of which I bring one to show you, and the silver bath allowed to drain thoroughly from the pellicle; it is then restored to its bottle by a glass or porcelain spatula, and two or three rapid rinses are given to it with distilled water (pouring it each time through one of these capsules to let the water drain away), and sufficient of a 30-grain solution of bromide of potassium in water is then put into the bottle, and the pellicle allowed to soak in it for ten minutes or so; another rapid rinse or two is given to get rid of the bromide, and the pellicle, after having been pressed between blotting-paper to get rid of the surplus water, is dried by a very gentle heat, and when dry is ready for use. There are some samples of collodion which appear to require organifying, and any of the organifiers in general use can be used. I have obtained good results from my own salicine preservative, from gum gallic, from tannin, and other organifying materials; and the only precaution necessary to be observed is that the organifier must, if used, be rinsed away previous to the drying of the pellicle. The advantages that I find from the use of this process are great rapidity and certainty of working; we dispense with the manufacture of an emulsion, and, in lieu of that, have merely to pour out the collodion to set overnight, the whole of the operation of sensitizing and washing a very large quantity of pellicle taking less than one hour. This brings me to a point which I am anxious to impress somewhat strongly upon you. A considerable amount of research into the matter has convinced me that in the process of forming bromide of silver an organic substance is formed by the contact of nitrate of silver and pyroxyline or gelatine, and that this organic substance is *very soluble in water*; consequently it is an object to use the water as rapidly as possible in the washing operations, so as not to soak this organic matter out of the pellicle. To this short washing this process lends itself most advantageously. It is not difficult to trace this organic matter, as, if a pellicle containing neither free bromide nor free silver be soaked in pure distilled water, and the water then exposed to sunlight, a deep brown colour will soon show the presence of the substance to which I have referred. This dried pellicle will keep without change; and when required for use it is only necessary to take as many of the dried tablets as would represent an ounce of the collodion, and, dissolving those tablets in ether and alcohol, we have at once an emulsion perfectly ready for use. This emulsion gives a beautifully fine film, and I have here a bottle of it to show you its perfection in this respect. I may mention that I also add organic matter, if I find it required, to the collodion itself, and a few drops of a saturated solution of gum-arabic in glycerine to each ounce of collodion added before it is poured out to set will be found very useful. The preparation of the plates and the development is carried on in the usual way, the latter being, of course, my strong alkaline developer.

(*To be continued.*)

A Green Varnish for Metals.—A varnish for small or large metallic articles can be prepared, says the *Industrie Blatter*, in the following manner:—Finely pulverized gum sandaric or mastic (the latter, however, is too expensive for some uses) is dissolved in strong potash lye until it will dissolve no more. The solution is diluted with water and precipitated with a solution of a copper salt, either sulphate or acetate. This green precipitate is washed, dried, and dissolved in oil of turpentine. This produces a fine green varnish which does not change under the effect of light, and will be especially useful for ornamental iron work.

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* Read before the Photographic Society of Great Britain.

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SATISFACTION IN PORTRAITURE.

A curious case, reviving an old dispute in connection with portraiture, has just been tried in the Exchequer Court. The question raised was the liability of the sitter to pay for an unsatisfactory portrait. The plaintiffs were a well-known firm of photographic portraitists, especially distinguished for their artistic finishing of photographic portraits in water-colours; and the defendant was a Staffordshire iron-master, named Lee, who declined to pay the amount claimed, £37 4s., for his wife's portrait, on the ground that it was unsatisfactory, and that an understanding was entered into at the time of sitting that it might be returned if it were unsatisfactory.

The facts appear to have been a repetition of the old story. Mrs. Lee was fascinated by a specimen consisting in the portrait of a beautiful young girl with a face beaming with delight and childlike innocence, painted charmingly in water-colours, and styled "The Blonde." Mr. Higgins, the business manager in the specimen room, is alleged to have assured Mrs. Lee that she would come out exceedingly well in the style of the specimen. Mrs. Lee, we gather inferentially, was a middle-aged matron; possibly a charming matron; but her portrait did not, as it probably could not, resemble that of the bright young girl. Her friends alleged that it made her look older than she was, and her husband said it made her cheeks look as though she painted, made her bosom so dark that she looked like a mulatto, and her chin was made to look "jowley." Mr. Lock, on the other hand, alleged that in the opinion of competent artists it was an admirable painting and captivating likeness.

Most photographers will be prepared at the outset to sympathize with the portraitist. Similar experiences are familiar to most of them. Nothing is more common than that a stout and elderly, possibly plain lady, should select from amongst the attractive specimens in the reception room the portrait of a pretty young graceful girl. and desire to be "done like that;" being woefully disappointed when her own true likeness, done with equal skill in the same style, is presented to her. The objection to the darkness of the bosom recals also a very common objection amongst persons ignorant of art, who, protesting against the existence of a shadow, say that one side of their faces is not darker than the other. Queen Elizabeth, it is said, used to protest against the use of shadow in her portrait, saying there was no shadow on her face; and the Chinese entertain a similar idea, and prefer portraiture in simple outline. But whilst the portraitist will enlist general sympathy amongst portraitists, the case of the sitter is not undeserving of consideration. It is too common a practice to flatter the vanity of the sitter at the outset by affirming that the youthful style of the selected specimen will be fairly reproduced in the portrait of the stout matron. And in coloured work the very attempt to make a heavy middle-aged person look youthful may spoil the likeness without securing the attractive style of the model beauty in the specimen. Under very rare circumstances indeed photography can be made to flatter; under the majority of circumstances its productions may be regarded as simple but exact justice; in some others they render justice without mercy; and in a few cases, generally of stout, middle-aged, blonde ladies, photography is really libellous, and there are few persons who would willingly pay a heavy sum for a portrait which they regarded as a libel. The painter's aim to flatter, not being bounden by the malicious veracities of photography, is generally more successful; but he, too, must often flatter or fail. Gay's apologue of the portrait painter aptly describes the case. He commenced his career with uncompromising truth.

> "His honest pencil touched with truth,
> And marked the date of age and youth.
> He lost his friends; his practice failed;
> Truth should not always be revealed:
> In dusty piles his pictures lay,
> For no one sent the second pay!"

Henceforth he resolved to paint his patrons not as they were, but as they wished to appear, and an overwhelming success was the result.

> "Through all the town his art they praised,
> His custom grew, his price was raised.
> Had he the real likeness shown,
> Would any man the picture own?
> But when thus happily he wrought,
> Each found the likeness in his thought!"

The chief difficulty of the portraitist is, that in case his work fails to satisfy, if payment be refused, the work is useless to any one for any purpose. A tailor or shoemaker making a misfit, has still his work, which may suit someone else, and the loss may be small. But, as a rule, a portrait is utterly useless if it fail to satisfy the original. Not every portraitist is in the position of the painter who, when a sitter declined to accept and pay for his portrait, quietly remarked that he should get more for the picture by adding a tail to the figure, selling it as a painting of a monkey! The photographic portraitist has but few alternatives—he may produce the portrait anew, or in coloured work he may generally modify so as to please. Failing these resources he can only appeal to a jury legally convened, and endeavour to secure, as Messrs. Lock and Whitfield have done, a verdict practically affirming the excellence of his work and the legitimacy of his claim.

ROYAL CORNWALL POLYTECHNIC EXHIBITION.

The Royal Polytechnic Society of Cornwall announces its annual exhibition for the fifth of September next. Amongst the numerous and varied subjects of competition, photography, which has for many years past held a prominent position in the exhibitions held at Falmouth, will again, we hope, hold a worthy position. Six silver medals and four bronze medals are offered to competitors amongst professional photographers, and medals and prizes, not particularized, are offered to meritorious productions by amateurs only. The subjects for prizes are, we think, very judiciously arranged; but we fear that rule eleven in the conditions of competition must tend to check some of the ablest contributors in sending their pictures. By this rule the successful competitor who last year received a silver medal is debarred from taking another such medal or a bronze medal for his work, however fine, either this year or next; hence the inducement for competing more than once in three years is, so far as the most capable, because most successful, contributors are concerned, materially reduced, for a certificate of merit will, amongst ambitious candidates for honours, scarcely count in comparison with a medal. The principle of handicapping a prize-taker may neither be unfair nor undesirable, but it would be wise to do this, if possible, in a manner which shall not discourage his competition. We hope, however, that the exhibition in September wil prove a good one.

The following is the list of prizes offered.

Sec. I.—For Professional Photographers.

1. For the best composition landscape, size not less than 11 in. by 12 in., a silver medal.
2. For the second best ditto, a bronze medal.
3. For the best untouched landscape, sky only printed from separate negative, size not less than 7 in. by 9 in., a silver medal.
4. For the second best ditto, a bronze medal.
5. For the best portrait, size not less than 8 in. by 10 in., a silver medal.
6. For the best group, size not less than 11 in. by 14 in., a silver medal.
7. For the best landscape by a dry process, size not less than 7 in by 9 in., a silver medal.
8. For the best interior, size not less than 7 in. by 9 in., a bronze medal.
9. For the best collection of photographs produced by a permanent process, mode of production to be stated, a silver medal.
10. For the best enlargement, size not less than 15 in. by 20 in., a bronze medal.

The judges may decline to make an award in any of the above classes when less than three pictures are in competition in that class.

In all cases when portraits are produced in any other way than by printing from a direct and untouched negative, the same must be stated.

Sec. II.—For Amateurs Only.

Medals and prizes are offered by the Society for meritorious productions in this department.

Note.—Carte-de-visite portraits are excluded from both sections of the photographic department.

PHOTOGRAPHY IN AUSTRALIA.

It will interest our readers to learn that a photographic society has recently been established in Victoria. It is always pleasant to contemplate the institutions which add to the well-being and promote the interests of life at home taking root in our colonies; and it is pleasant to know that the adherents of our art are sufficiently numerous and fraternal in the important and southern colony to establish a photographic society. One of the first aims stated in the enumeration of the objects of the society is the promotion of an annual exhibition of photographs. Nothing, we believe, is more conducive to the growth of excellence in the art than the establishment of annual exhibitions. The opportunity of examining and comparing the productions of others, and the emulation which the sight of good work induces, are amongst the most important factors in securing progress, and we heartily wish success for this effort on the part of our Australian brethren. At present, as the courteous honorary secretary, Mr. Charles Hewitt, informs us, "the prospects of the society look well." We hope from time to time to be able to lay before our readers interesting details of the proceedings and progress of the society.

THE COFFEE PROCESS.

One of the simplest and most efficient dry-collodion processes has entered very little into the discussions which have occupied dry-plate photographers of late. The coffee process has varied and attractive claims: it is simple in working, and efficient in result; the plates are moderately sensitive, and keep moderately well; and there are not, as in some processes, vagaries and uncertainties every now and then arising to perplex the amateur. We have been especially reminded of the claims of this process lately by the receipt from time to time of some charming prints from a correspondent on the Continent. The photographs were generally very charming in a pictorial sense; but there were singularly perfect gradation of tones, extreme delicacy, and perfect atmospheric transparency, combined with force, very rarely met with even from wet plates. The prints reminded us very much of the work of Mr. Russell Manners Gordon and Mr. Henry Cooper. As our correspondent very rarely came into contact with other dry-plate workers or their work, either for hints or comparison of result, we were especially interested in learning details of the process employed. This, we learn, is the coffee process, as modified by our esteemed collaborateur—from whom of late we have heard but too seldom—Mons. Constant. The details as given by our present correspondent, who signs "J. H. W.," are so full of interest, that we feel it will serve many of our readers to have the process described precisely as our correspondent works it. He says:—

"One of the chief advantages of the coffee process is, I think, the uniformity of results obtained. I now seldom make a failure. As a proof, last summer I exposed thirty plates during an extended tour in the Higher Alps and lakes of Northern Italy, and developed them upon my return here, at the end of a month from time of exposure of the first plate, and a day from time of exposing the last, and there was not a failure among them. Some, of course, were better than others, but none that would not be called good pictures. Taking those that I have from time to time sent you as the standard, I have used some of these plates after they had been prepared for fourteen months, and could not detect that they had deteriorated, though I gave them a rather longer exposure than I would have done with plates more recently prepared. The formula and directions for the preparation of the plates were given to me by Mr. A. Bauernhentz (former associate of M. de Constant), of this place (Lausanne), a photographer of great experience and ability, and who has frequently prepared plates for me, and always satisfactorily. He says, however, that I obtain better results with his plates than either he himself or others can do. If this is so, it can only result from greater care in the development and manipulation, as we use quite the same formula, which I now give you:—

"1st.—Coat a clean dry plate with a substratum of albumen, formed of the white of one egg to 1,000 grammes rain water. By first breathing upon the plate, the solution will be found to run freely. Allow plate to dry.

2nd.—Flow with collodion (Mawson's, I use), and sensitize in an 8 or 9 per cent. bath.

"3rd.—Wash well in rain-water containing a few drops acetic acid. Give second washing in ordinary water.

"4th.—Allow plate to drain for a moment, and then flow with solution of coffee, composed of—

"Fine ground coffee	10 per cent.
Fine ground white sugar ...	4 "
Boiling water	100 "

"Filtered, and used when cold.

"When quite dry the plates are ready for use."

We may add, that an example of the character of the transparencies produced on these plates leaves nothing whatever to desire. The tone is the rich warm black, with a slightly purple tint, which is so much desired.

THE PARIS PHOTOGRAPHIC EXHIBITION.

[from our special correspondent.]

In my former letter I pointed out what a valuable collection of results of scientific photography have been brought together this year at the Palais de l'Industrie. It is impossible, indeed, to do justice to the many branches that are here represented, for every series of micro-photographs that are shown is replete with interest. M. Jules Girard exhibits some fine examples of crystals, enlarged by means of the microscope and then photographed; examples which show the great assistance that a mineralogist might derive from the study of photography, as also the aid that professors at schools and colleges might make of the art for instructional purposes. M. Jules Girard also shows some results obtained during a microscopic investigation of collodion, in which the texture of the film is demonstrated in a way which cannot fail to interest photographers.

M. Ravet, whose microscopic pictures of the Phylloxera I have already mentioned, sends some striking pictures of Infusoria, and particularly of diatoms. M. Dagron, who executed the minute photographs of despatches sent into Paris by pigeon post, shows how the same principle of reducing documents to minute dimensions upon transparent films may be made use of in other ways: to wit, in repositories where bundles upon bundles of valuable documents are stored, which cannot be referred to without trouble, or where there is any risk of such papers perishing from fire or other element; in these cases this ingenious photographer suggests that tiny reproductions should be taken, to preserve for reference, and by way of insuring the originals from loss. The idea is a good one, and specimens of public and private documents, reduced to within the smallest limits which are readable under a microscope of low power, are exhibited by M. Dagron.

Turning from this department of the exhibition, we come to the pictures contributed by the Direction of Fine Arts at Paris, which has, it seems, taken the wise step of preserving historical and other monuments by means of photography. The chief of the Service des Monuments Historiques, M. Violet Leduc, exhibits a large series of ancient churches and old chateaux which would gladden the heart of any archæologist. It is a pity we have not in this country a department of the same nature to collect pictures of ancient relics that exist throughout the length and breadth of the land, in our metropolis and elsewhere. The Fine Arts' Department of France entrusts certain officers with the duty of selecting such monuments as are interesting by reason of their beauty or historical character, and the photographers of the department are then commissioned to execute photographic copies of the same. The work seems to be carried out in a most systematic manner; thus we have pictures of the old cathedral at Lisieux taken *avant la Restauration*, and also in its restored state.

While on the subject of architecture, I may mention a most useful album that is contributed by M. Bertoja, of Venice, a work which would be a treasure to any architect. It consists of studies of all classes of architecture, and represents a history of the art from the middle ages to the present day. Herein we can study the Corinthian column, and the Doric, the Byzantine style, and the Renaissance; all the pictures being taken on a scale sufficiently large to show the most minute details. The same photographer exhibits pictures of several of the Italian palaces, and indeed the exhibition is rich in photographs of monuments and architecture. M. Balagny, of Paris, has a series of pictures of churches; M. Braun shows some fine carbon prints of the Sistine chapel, &c.; M. Guipet, of Paris, sends pictures of old Paris; M. Kösler, of Landeck, has a fine representation of Castle Camenz; M. Lampué, of Paris, shows sculptures and bas-reliefs of modern Paris; M. Mage, of Brest, a magnificent panoramic view of that city; M. Naya, of Venice, whose name is well known to most photographers, a magnificent series of the palaces of Venice, the pictures measuring nearly a metre in length; M. Peetor, of Paris, shows a series of French churches; M. Scholz, of Gorlitz, sends pictures of architecture in Saxony; and M. Wills, of Odense, of that of Denmark. In this department, we must not forget to mention Captain Abney's magnificent pictures of the Colossus of Thebes and of other Egyptian monuments, which I believe that clever photographer intends to publish, together with others of the series, some time this autumn. Captain Abney also sends some leafy pictures of Knowle Park and Windsor Castle, taken by the Royal Engineers at Chatham under his direction.

Among those who exhibit illustrations of the way in which photography may be of assistance in medicine, I have forgotten to allude to a series of pictures executed by M. Brandel to show various skin diseases. The pictures are tinted in accordance with nature, and constitute a valuable aid to the physician.

Public departments make a great show at the Paris Exhibition. Besides the observatories of Paris and Kew, which are represented, and the Service des Monuments Historiques, we find the Depot des Fortifications, which exhibits plans of fortifications taken by means of the photographic planetable, and photo-lithographic reproductions of ordnance maps. The Depot Central de l'Artillerie is represented by pictures of guns, waggons, carriages, &c., in use in the French Army. The Russian State Paper Office sends a large collection of reproductions of historical portraits obtained by the Scamoni helio-engraving process. The Ecole des Ponts et Chaussées sends photographic reductions of maps; the Ecole des Mines, photographs of crystals; the Direction des Phares (Lighthouses), photographs of flames; the Conservatoire des Arts et Metiers, micro-photographs relating to the manufacture of paper; the Portuguese State Paper Office, photo-engravings of various kinds upon steel and copper obtained under the direction of M. Rodrigues, and the Grandes Administrations Publiques, Chemins de Fer, Justice, &c., pictures showing the use made of photography in these offices.

As regards portraiture and art photography in general, the Paris exhibition of this year is decidedly disappointing. The best picture in the collection, to my way of thinking, is one of a veiled female figure exhibited by Hansen, Schou, and Weller, of Copenhagen. A veil covers the whole face with the exception of the eyes, which peer out clear and bright; the drapery is charmingly arranged and thoroughly well rendered. The same firm also shows some very good cabinet pictures printed in permanent pigments. Several fine groups of Portuguese figures are shown by M. Fonseca, of Oporto; the pictures are of a dark rick tone and smooth and harmonious, while the grouping of the picturesque figures is that of a thorough artist. Perhaps the best portraits are those shown by Messrs. Cooper, of Hull, whose good work is well known to the readers of the Photographic News; at any rate, they are quite on a level with the larger portraits shown by Reutlinger, Liebert, and other famous Parisian photographers. The pictures shown by Reutlinger and Liebert are, however, all printed in carbon, and for this reason, no doubt, handicapped; those of Reutlinger are very nearly as brilliant as his well-known silver pictures.

M. Brandel, of Warsaw, sends some well-executed twenty-inch plates, of which, however, half might be cut away with advantage and without interfering with the portraits, with which, otherwise, there is little fault to find. M. Chambay, of Paris, sends some good portraits. M. Denier, the well-known Russian artist, exhibits a series of fine large portraits, without retouching, all of which possess a delicate cold tone, similar to that of engravings, such as is always admired in the collodio-chloride pictures of Mr. Bruce, of Dunse. M. Feilner, of Bremen, sends a collection of portraits and studies of a dark harmonious tone and artistically executed. M. Klary, of Algiers, has made good use of the picturesque models at his disposal, and exhibits a frame of small pictures representing different Algerian types. M. Monckhoven has two frames of small portraits executed in carbon, which, however, do not show this mode of printing to advantage, many of the impressions not being quite clear, a fault to be observed in most of the carbon prints throughout the exhibition. Perhaps the larger pictures of M. Offenberg, of Amsterdam, are as successful examples of carbon printing as any in the collection. M. Naya sends some groups descriptive of life in Cairo and Italy, which would have been better if the olive complexions had not been so darkly rendered. M. Piquée, of Troyes, shows a frame of passable portraits; and M. Relvas, a Portuguese photographer of note, who sends also phototypes, exhibits several well-executed pictures. MM. Schulz and Suck, of Carlsruhe, have some good portraits after the style of Loescher and Petsch, of Berlin, and M. Bamberger shows portraits in carbon, which are not so clear as they might be. M. Szacinski, of Christiania, has some creditable portraits, as also Valetto and Co., of Mexico, taken after the Vienna style. Finally, M. Zinsler, of Rome, exhibits several charming pictures, in which the drapery especially is well and skilfully depicted. There are probably a dozen other portraitists who exhibit, but whose work scarcely calls for special notice.

I will treat of the landscapes, enamels, and mechanical printing in my third letter.

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FRENCH CORRESPONDENCE.

M. JANSSEN ON THE HISTORY OF PHOTO-ASTRONOMY—THE IMPORTANCE OF SECURING DAILY PICTURES OF THE SUN ON A LARGE SCALE—THE PARIS OBSERVATORY—PHOTOGRAPHY AND MEDICINE.

NOT a meeting of the Academy of Sciences passes without some application of photography being brought forward to illustrate the work of the lecturer. Astronomers, geologists, naturalists, engineers, physicians, all complete their communications by adducing proofs prepared by means of photography. But Monday last may be considered a red letter day in the history of our art.

M. Janssen, the eminent physicist, to whom we already owe so many important works, gave a resumé of the aid which photography has contributed towards the development of astronomy ever since the invention of the art. In France, M. Fays appears to have been the first to call attention to the matter, and many gentlemen, MM. Fizeau, Leon Foucault, Perro, adopting the idea, made many discoveries by means of this application. In England Mr. Warren de la Rue demonstrated the valuable assistance that photography could furnish by executing a series of fine photographs of the moon, which are now daily admired at the Photographic Exhibition in the Palais de l'Industrie. Mr. Rutherford, of New York, has also executed some magnificent images of our satellite, and the same gentleman, according to M. Janssen, is now occupied in producing celestial maps by means of a photographic process. These imitations have found followers in Russia, in Germany, and in Italy.

Everybody is aware of the great rôle which photography played in the observation of that curious phenomenon which marked the end of 1875, the transit of Venus across the sun, and what magnificent results were then secured by the aid of the camera. It is, therefore, quite unnecessary to insist upon the importance of celestial photography, but M. Janssen thinks that the time has now come for the application to enter a new phase, and points out the necessity of securing daily images of the sun by means of the camera. He desires that these impressions shall be of very large dimensions, that they shall be secured direct, and be of a very perfect nature. In the present condition of our science he believes that the reproduction of the details in the structure in the photosphere is indispensable in order that any profitable discussion can take place in relation to it. The solar pictures should reproduce the faculæ with their outlines accurately given, and should represent the spots upon the sun in all their minor details. Only pictures on a large scale are capable of giving us all these details in an accurate manner.

It is true, as the worthy astronomer observed, that difficulties arise in proportion as the diameter of the image increases, and therefore, in order to secure results altogether satisfactory to science, it would be necessary to construct special observatories for this description of photographic work, and to place them under the charge of persons peculiarly fitted to undertake this kind of duty.

The plan which M. Janssen has unfolded before the Academy is one which he himself has organized and applied for two years past at the Astronomical Observatory at Montmatre, by Paris, and where he has secured the most satisfactory results, examples of which he placed before his colleagues at the Academy. These solar images, which excited the greatest amount of interest among the members of the Academy, depict the sun's disc of a diameter measuring twenty-two centimetres, and notwithstanding these dimensions, which are considerable when it is remembered that the clichés are taken direct, the pictures are endowed with the most perfect sharpness. The eye can study with the utmost facility all the spots, faculæ, and granulations; but the point upon which the eminent astronomer laid the most stress, was that positive pictures could be secured in which all the details of the solar surface were reproduced with the same degree of clearness, without the grain of the paper interfering in the least, as is always the case with pictures from negatives of small dimensions.

M. Janssen makes a big stride of progress; he prints his pictures in carbon, so that not only can the copies be well distributed, but they are of a nature to keep indefinitely; and the value of such a series of photographs of our luminary in years to come, when they may be referred to as matters of history, is such that it cannot be estimated. Thus M. Janssen remarked that upon the pictures of the sun executed during the last few days there was no spot visible, which he tells us to be explained by the season of the year.

In referring to this communication of M. Janssen, so interesting from a scientific point of view, M. Leverrier, the director of the National Observatory of Paris, remarked that a photographic service, such as that described, has been organized in that establishment under the direction of M. Cornu, who has already secured some remarkable reproductions of the moon. He also announced that very shortly he would submit pictures produced direct by means of the large 36-centimetre lens belonging to the observatory.

The Academy was of opinion, however, that the useful movement set on foot by M. Janssen should not rest there. It was of opinion that the daily reproduction of the sun would be all the more useful if it could be undertaken in all countries at the same time, for the sky could never be clouded everywhere, and therefore there would be always a successful image taken somewhere. An opinion was expressed that the duty should be undertaken in all observatories throughout France, and that foreign institutions would then follow the example. One member of the Academy, M. d'Abbadie, observed that in Upper Egypt it never rains, and a photographic apparatus destined to produce daily images of the sun would be able to work in such a climate uninterruptedly. He thought that if M. de Lesseps would intercede for them with the Egyptian Government, he would render a very great service to science. It is scarcely necessary to add that the illustrious constructor of the Suez Canal accepted the mission.

I have perhaps dwelt rather too long upon this subject, but it was one of such importance that I felt sure the readers of the PHOTOGRAPHIC NEWS would feel an interest in it. For a long time science hesitated to utilize photography, which it has never appreciated at its true value. Then the camera was accepted as an auxiliary means of controlling work. Now it is enthroned alone in a post where, besides being better than all other methods of observation, it is the only faithful recorder of facts, for no other means exists of marking with such certainty and accuracy the daily appearance of the solar disc.

What photography has done for astronomy, it may do for other branches of science. A single visit to the exhibition open at this moment in Paris under the auspices of the French Photographic Society will suffice to convince the most sceptical upon this point. An excellent example is afforded by a series of frames sent by a well-known physician, Dr. Luys; these frames enclose enlarged images of the human brain in its normal condition, and in the different phases of general paralysis. In comparing these images one with another, one may trace the gradual change that is developed, and which after a time destroys the nervous element of the brain; you may follow, so to speak, the path of destruction. What information there is here at the disposal of medical men! The day is not far distant, it is very apparent, when every hospital will have its photographic laboratory in close vicinity to the anatomy room. People are beginning to understand that the study of photography is one of the most useful that the student can well undertake.

Ernest Lacan.

ENFORCING PAYMENT FOR A PORTRAIT.

A case was recently tried in the Exchequer Division of the High Court of Justice, in which Messrs. Lock and Whitfield, photographers and miniature painters, sought to recover £37 4s. from Mr. Lee the value of a portrait of the defendant's wife. The defence was that the portrait was not satisfactory, and could therefore be returned in accordance with the agreement entered into between the parties.

Mr. Montague Chambers, Q.C., and Mr. W. G. Harrison were counsel for the plaintiffs; Mr. Fullerton represented the defendant.

Mr. Chambers, in opening the case, stated that the plaintiffs were eminent artists of upwards of twenty years' standing, and were patronized by the Queen and other members of the Royal family. Nothing was said at the time of the agreement in reference to the defence now set up, namely, that if it did not give satisfaction it might be returned. The lady sat several times, and her husband (a Staffordshire ironmaster) more than once accompanied her. The picture of the "The Blonde" seemed to have been selected by the lady as the model for her portrait. The former represented a beautiful young girl in a light dress sitting at the seaside, with her hat and feather thrown carelessly behind her. Various interviews took place between Mr. and Mrs. Lee and the artist in Regent Street, and several alterations in the portrait were suggested and carried out. Ultimately it was completed and sent home, but was returned for the reasons stated, besides the objection that it was not a likeness of the original. It was impossible, observed the learned gentleman, for an artist taking a likeness to make a middle aged matronly lady look like a beautiful young girl, blushing as a bride, and with a face beaming with delight and childlike innocence. After the picture was returned Mr. Lock had it criticised by some of the best artists, especially for the sake of his own reputation, and the result of that inspection was that it was pronounced an admirable painting, and rather a captivating likeness.

Mr. Higgins, the plaintiffs' business manager at Brighton; Mr. Lock, the artist himself; and Mr. Gush, an artist in London, gave evidence in support of the above statement.

Mr. Fullerton, in opening the case for the defendant, stated that Mr. Higgins had persuaded Mrs. Lee to have a portrait executed, and expressed his opinion that Mrs. Lee would come out exceedingly well in the style of coloured photograph, with a distinct agreement that if the effort were not successful no charge should be made. Upon this understanding photographs were taken and the sittings were given by Mrs. Lee. When the picture reached Mr. and Mrs. Lee, at Downside, near Leatherhead, they did not wish to rely upon their own opinion, and the picture was therefore exhibited for some time in their house for their friends to state their opinion in reference to it. The result was that it was unanimously disapproved of by them all.

Mrs. Lee was examined at some length in support of the statement of the learned counsel. She said the picture, instead of being a water-colour drawing, as promised, was a very badly coloured photograph; and her friends told her that it made her look much older than she really was.

Mr. Lee's objection to the portrait, as he stated in evidence, was that the cheeks were so red that it gave the appearance that they had been rouged. The surroundings of the picture had not at all the appearance of a water-colour drawing, but of a badly coloured photograph. The bosom was of so dark a colour that it more resembled the skin of a mulatto than of a fair-skinned English woman. The lines about the mouth, around and under the chin, gave a very different appearance from that of the portrait of the original. The chin, especially, was made to look "jowley."

The learned judge having summed up at some length, the jury, after having retired for a few minutes, returned a verdict for the plaintiff.

Judgment was given accordingly.

The *Daily News*, whose report we have copied, has the following comments on the case:—"It is easy to sympathize with both sides in the recent trial as to the merits or demerits of a lady's portrait. If it is true that the lady, though matronly in appearance, wished to be depicted in the attitude of a maiden of seventeen, one feels for the conscientious artist. If it be true that the work of art produced represented the sitter as 'jowley,' what hard heart will refuse to feel for the sitter? It is really next to impossible to get a likeness of anyone that will satisfy everybody. Photography even has adopted flattering devices, and when it does not flatter it caricatures the victim. The work of great artists is beyond the purse of almost everyone, and besides, even great artists don't usually give satisfaction. Lionardo's Mona Lisa is extremely 'jowley,' after all his five years' pains, and it is unlikely that Mona Lisa's husband was satisfied with any part of the artist's diligent and painstaking performance. We all have an ideal self, and if the painter designs either his ideal of us, or ourselves as we really are, we fail to recognize the likeness. Perhaps the best way to avoid all heart-burning is that, now usual, of being painted in a very elaborate dress, with elaborate boughs of flowering trees in the hands. With pains, the artist can get the flowers and lace right, and then, as a decorative result is attained, the features and expression don't much matter. But photography, even that abominable thing coloured photography, can never treat textures and tones so delicately as to further this mode of evading the difficulty of portrait painting."

Correspondence.

NON-ACTINIC ARTIFICIAL LIGHT FOR DARK ROOMS.

Sir,—I do not know whether any of your readers have felt the inconvenience of extemporising a yellow covering for the light in their dark rooms at night, when perhaps developing their dry plates which have been exposed during the day, or inwardly grumbled at the unsatisfactory light they have thus obtained, which makes it difficult to see whether the plate is cleanly developed. At all events, if they have not, I have, and having adopted a simple method of overcoming the difficulty, I send it for the benefit of those interested.

It consists merely in making the flame itself yellow; and the means I have adopted is to fuse a head of carbonate of soda into a ring of platinum wire, and to fix the end of the wire to the light-carrier, whether candle, spirit lamp or gas, and bend over the soda into the lower part of the flame. This plan I have found to answer perfectly.—Yours truly, R. B.

PRICES OF SILVER AND CARBON PRINTS.

Sir,—Although I carefully and eagerly read the Photographic News regularly as the weeks come round, and digest all that is valuable in it, I have never ventured to write a note for publication before. The point at which I aim, and which is of great importance at the same time, is one, I think, never hinted at before in the News. Every photographer, I think, would like to produce his portraits in carbon, because of their stability; but here is the drawback: cartes-de-visite are produced at the present moment by hundreds of photographers at five shillings per dozen; not but that they would like to get a better price, but cannot, owing to the many others in the same locality doing them at the same price; this compels them to do likewise. It would pay no photographer to produce twelve C.D.V.'s in carbon, mount them, and press them, for five shillings, and if ten or twelve shillings a dozen is asked, it is thought exorbitant for carbon C.D.V.'s, and the answer is, Well, no; we will have those at five shillings a dozen. In carbon printing the waste fetches nothing, while in silver printing there is obtained so much for clipping, and so much for the silver chloride and other waste. With little advantage on the side of silver printing, and the demand for portraits at a low price, how is it possible for the carbon process to supersede the silver work? With (I may safely say) the majority of photographers, it is a difficulty I could never see through, unless the carbon process becomes very much simplified. It will do undoubtedly with those photographers who work entirely for the upper ten, and can get just whatever price they ask for their work; but this is not the case with the majority of photographers, who have to live in a great measure by competition as regards price.

Any hints that may clear away these difficulties, I am sure, will do much for carbon printing, and will be gladly accepted by scores of your readers besides myself.

A good plan to mount silver prints that have to be exposed in show frames is to mount them upon glass by brushing round the edge of the piece of glass hot glue, about an eighth of an inch on its surface, and carefully laying the print down upon it while wet. When it is dry, it is stretched beautifully and flat, there being no chloride of lime or sodium hyposulphite, as in the cardboard usually employed, to affect the portrait. I often mount enlargements 24 by 18 by this plan. If the print is thoroughly toned, fixed, and washed, I will be bound to say that no such thing as fading is seen to occur.—I am, yours very truly, A. J. Jarman.

41, *Queen Street, Ramsgate.*

PATENT FOR PELLICLES.

Sir,—The brief notes of the meeting of the Photographic Society of Great Britain, as reported in the News of the 16th inst., seem to show that a short and sharp passage of arms occurred between Col. Stuart Wortley and Mr. Kennett relative to the validity of the latter gentleman's patent. I must say that my sympathies are entirely with the gallant Colonel, and I can hardly believe that any action for infringement of patent can lie against any one who, having made more gelatine emulsion than he requires for present use, sets it aside in a water bath to dry, rather than allow it to spoil. I can quite understand the *inventor* of gelatine emulsion obtaining a patent for having superseded the use of collodion, because this is an undoubted discovery; but when, ignoring the discovery itself, a patent is obtained merely for its desiccation, it certainly is calculated to raise a doubt as to the "eternal fitness of things" with regard to patent law. For we must remember that this very patent is itself an infringement of another patent. What is patent gelatine, with which the pellicle starts? It is a liquid glue which has been concentrated to dryness; and the patentee of the pellicle seems to claim that having dissolved this and added to it bromide of silver, he, trying it a second time, has made a fair case for protecting himself by patent. This scarcely seems fair. What says the inventor of the gelatine emulsion to it, and what says Mr. Nelson? The matter now stands thus, that while a carpenter is allowed to redissolve the dried-up contents of his glue pot, and the photographer may even utilize the dry residue of his gelatine mounting material by adding water and applying heat, this must no longer be done if either of these colloids have had an addition of silver bromide.

A friend told me the other day that by adding one drop of water to each ounce of collodion, slipping of the film would be greatly obviated, and I was much pleased in trying it. Supposing Mawson, Huggon, and Thomas had patented their collodions, should I be allowed to obtain another patent for this valuable addition? The cases seem to me parallel, and I should much like the subject to be ventilated.—I am, sir, yours, &c., Photo. Chemicus.

COMMERCIAL QUESTIONS AT PHOTOGRAPHIC SOCIETIES.

Sir,—Will you allow me space for a brief comment upon a singular scene which occurred at the last meeting of the Parent Society? The unwritten but understood rule of the Society is to avoid all reference to the commercial phases of photography. Colonel Stuart Wortley, in his interesting paper on emulsions, took occasion—possibly innocently enough—to say that there could be no patent in a sensitive pellicle, as its manufacture had been publicly described. The chairman, at the close of the paper, asked Mr. Kennett, the patentee of a pellicle, if he had anything to say to the meeting, and that gentleman, naturally enough, rose, and began to make allusion to his patent, which he felt had been assailed. The chairman, the gallant Colonel, and others at once joined in a protest against this. No reference to patents or commercial considerations could be permitted at a meeting of a learned society. Mr. Kennett, having first been called upon by the chairman, was put down by him when he referred to allegations in the Colonel's paper, whilst the Colonel was permitted in his final speech again to refer to the subject, and to offer to guarantee anyone from legal risk who would take up the matter commercially.

Now, all this may, possibly, be quite right. It may be right that the readers of a paper should, in the public interest, be permitted to practically attack a patentee; and the patentee should not be permitted to reply, because he has a commercial interest in the matter. It may be right, because it was the chairman's decision; but it seems unfair, and was certainly hard on Mr. Kennett.

But the primary object of my letter is to ask if the maintenance of a rule which excludes allusion to much important matter in a society like the Photographic Society is desirable or wise? I am offering no opinion of the special case which arose on the evening of the 13th. Mr. Kennett's patent may be good or bad. The Colonel may be right or wrong in attacking it—I don't know—but if Mr. Kennett had been permitted to state the grounds whereon he based his claim to a patent, I, and everyone present, would have been able to form some fair opinion on the subject, and to determine how far those claims were valid. If the subject of the paper was of sufficient interest to occupy the attention of the Society, surely it was important to know whether the practice of some parts of the process described were or were not barred by the existence of a patent.

Photography is in this day rather an industrial art than a science. Commercial interests are amongst the primary interests associated with it, and professional photographers its chief representatives. Surely it is unwise to ignore in the meetings of the Society subjects which are of vital interest to so many of its members. This plan of playing at being a learned society leads to nothing but dulness, often to a scarcity of papers, to scanty attendance of members, and to utter absence of interest in the meetings. There are many subjects to which you, sir, have called attention as requiring discussion—such as copyright in relation to photography, ownership of negatives, patent rights, &c.—which require well ventilating in an equitable spirit. Is it not time for the Photographic Society to include such questions amongst its discussions?—Yours respectfully,

Q.

[We do not think it likely that the Photographic Society will include commercial questions in its discussions, although, possibly, a question like copyright might be regarded as legitimate. In any case, our correspondent might, without impropriety, address his proposal to the President and Council of the Society.—Ed.]

Talk in the Studio.

Varnish for Photographs.—The *Pharmaceuten Central Anzeige* gives the following formula for a varnish for cards, photographs, &c.:—"Put from thirty to forty grammes of light yellow, transparent dammar lac into a flask, and pour over it about 180 grammes of pyroxylic spirit. With occasional shakings the mixture may be left for about a fortnight at an ordinary drying temperature, at the end of which time the resin, now thoroughly saturated with the spirit, may be decanted off, care being taken not to disturb the sediment. Then to four-sevenths by weight of this varnish add three-sevenths by weight of thick homogeneous collodion, shake them up well together, let the mixture settle, and store in well-stoppered bottles. To use the varnish, draw vertical strokes across the surface to be varnished with a soft beaver-hair pencil dipped in the varnish. After the first coat of varnish dries there is a clear glossy surface, and after two or three coats have been applied, a film is formed which remains glossy in spite of the action of the weather, and retains its elasticity in all cases where the cards have to be rolled. This last quality renders it especially suitable for the protection of maps, plans, and topographical drawings, and the fact that it has no chemical influence upon colour is an argument in favour of its use as a varnish for photographs in cases where extreme glossiness of surface is deemed desirable."

Toughened Glass.—M. Stebbing, writing to our Philadelphia contemporary, says:—"Much has been said upon the value of hardened glass for photographic and chemical purposes, but I advise my readers to be very careful in its employ, for it appears that no guarantee can be given that evaporating dishes, &c., can always resist heat. I desired to experiment the other day upon the value of this invention, and purchased an evaporating dish, filled it with a concentrated solution of nitrate of silver, in order to procure crystals of that salt. I put it over a Bunsen burner, but took the precaution to put the whole into a large dish. Happily that I did so, for in a few minutes the bottom of the evaporating dish flew into a thousand pieces, and the liquid was projected out in a second of time. A thousand pieces is a true expression, for the bottom was honeycombed in every direction. Now, had I taken an ordinary glass dish, and it had cracked, ten to one I should not have had a loss, for the liquid would have only filtered through the crack, and given warning, whereas hardened glass does not crack, but flies into small pieces without giving any previous notice."

M. Janssen, having arranged large photographing telescopes at his house at Montmartre, has found, during the cold period, from the beginning of May up to the 10th, the sun had no spots at all. The photographs produced by him are about 20 centimetres (8 inches) in diameter.

New Artificial Light.—The *English Mechanic* says:—"There should be good news in store for some branches of the photographic act, if the rumour be true that at Bunsen's laboratory a large quantity of a new alloy, capable of giving during ignition a very brilliant light, is being made. The new metal is said to burn readily, and to emit a bright light of great actinic power."

Imitation Silver on Stone and Plaster.—Take two sheets of mica, and render them perfectly white by boiling in hydrochloric acid, or by the action of fire. Wash and dry, and then bruise them to fine powder, which sift. Mix the powder with very light collodion, and with a soft camel's hair brush put two or three layers on the object. This coating, as soon as dry, will assume and preserve the appearance of silver.—*Scientific American.*

To Correspondents.

T. Coam.—As a rule, the lenses of the best opticians will cover plates of the full size for which they are made without the aid of a very small stop. But in covering, much depends on the subject. Few lenses would cover perfectly to the edges without a small stop if they were used to copy a map or geometrical diagram on a plate of the size for which the lens was made. The lens to which you refer would doubtless cover without a small stop if the building were taken pictorially as an object forming part of a picture; but if the building fill the plate, it is very improbable that it would be sharp to the edges without a somewhat small stop.

C. E. M. D.—The causes of insufficient vigour in a negative are various, and it is difficult or impossible often to determine the precise cause in operation from merely examining a print. The use of a weak light, of a new collodion, of a weak bath, would all tend to produce lack of vigour. Insufficient development, washing the free silver from the plate by carelessly applying the developer, would tend to a similar result. In the examples sent, much more vigour is not desirable. There is no standard of what constitutes a "proper Rembrandt." The style is purely arbitrary, and depends upon the free, and frequently abrupt, use of shadow, and the sparing use of lights and half lights. The best results are obtained by the exercise of good taste. The best plan is to obtain a collection of examples, and study them.

Inquirer.—Paper may be parchmentized by immersing or floating for a few seconds—say half a minute—in diluted sulphuric acid. About the following proportions will serve:—

Oil of vitriol	2 ounces
Water	1 ounce.

Blotting-paper answers best. After floating for half a minute, wash well in two or three changes of water. 2. We cannot say with certainty, as we do not know its precise constitution. As a rule, a final wash of gallic acid secures keeping qualities and cleanliness, but at the expense of sensitiveness.

J. Worsnop.—Registration of a photograph is a necessary preliminary to taking legal action for infringement of copyright. But registration does not confer copyright; it is merely a legal record of the fact that you are the owner of a certain copyright. If you have taken a certain view, the copyright is your property. If it is copied without your permission, the Copyright Act gives you a remedy by application to a magistrate, by whose assistance you can recover penalties from the infringer. Registration is necessary to secure the copyright you already possess.

Ireland.—We prefer a piece of felt for a pad in the printing-frame. Want of perfect contact does not, however, always arise from imperfections of the pad. It may be because the back of the printing-frame is somewhat warped or uneven, or that it has not a sufficient number of springs holding it in contact. The paper being slightly damp when put in the printing frame is a frequent cause of the paper wrinkling and cockling in the frame.

J. W. Starr.—It is certainly possible to shorten the focus of a lens by adding another lens of shorter focus, as that is what is practically done in making a portrait lens. The front lens of the combination resembles a landscape lens of long focus, and the addition of the back lens, amongst other things, shortens the focus. But you will see that to do this efficiently the skill and experience of a practical optician are required. You may, possibly, by trial, make something of yours; but experiment alone will aid you. Your shorter focus lens must be placed behind the other, at a suitable distance from it.

J. H. W.—Your transparency is excellent. Nothing could be finer than the tone. See an article on another page. The portraits also are very good. Those taken in the open air are best.

Received.—"The Chemistry of Light and Photography," by Dr. Vogel.

Several correspondents in our next.

The Photographic News, June 30, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Publication of Photographs—Chemical Notes in Rhyme.

The Publication of Photographs.—The publication of photographs is scarcely upon a satisfactory footing. In all London there are hardly half-a-dozen shops that make the sale of photographs a speciality, and in Paris, where the number is greater, business seems to be conducted in anything but a profitable manner, so far as the producer is concerned. The other day, while passing through one of the principal streets of the French metropolis, we noticed signs of the times which were anything but reassuring. Fancy a dozen stereoscopic slides, mounted upon thick boards, selected *a choix* from a multitude of such prints, selling for two francs and a-half, or, say, two shillings English money—and this, too, at respectable shops, where one would expect a high-class trade to be done. Twopence each for stereoscopic slides, or, cut them in halves, and say a penny a-piece for carte views of *Notre Dame*, the *Tuileries*, &c. How is it possible that a trade can be satisfactorily carried on upon these terms? How much profit, we should like to know, falls to the shopkeeper, and how much to the printer? If we knew this, we might then be able to say what the photographer himself received for his pains in taking the negative. Many of the stereos to which we refer were copies from originals, which had been mounted suitably for the stereoscope and then reproduced, so that there was no difficulty in mounting, as the copies could be pasted on the card in one piece. Perhaps the photographer who took the negatives in the first instance did not get paid at all, but copies were taken of his pictures by French leave, as we say in this country.

Another thing in connection with photographic publications in Paris struck us also with some force. Although it was but a few days after the death of George Sand, we only saw during our promenade through the city but two solitary portraits of the talented authoress for sale in the shop-windows. When Thackeray and Dickens died in this country, it will be remembered, the London shops, which did any business at all in photographs, were full of pictures of these worthies; and even now the portraits of our favourite authors command a steady sale. In Paris, however, pictures of George Sand seemed to create but little interest, and we fear that not a hundredth part of the sale reached by the photographs of the Pantin victims of some years ago, or of the slaughter of the Communist prisoners, will be effected. With us it cannot be denied that the sale of carte and minor photographs has been somewhat overdone of late, and that the public taste is beginning to pall of these kinds of pictures. But there is every reason to believe that if photographs of larger dimensions were properly placed before the public, photographers would have no reason to complain of want of patronage. As we have already said, the number of shops that make photographs a speciality are exceedingly limited, and there are very few opportunities of bringing an effective photograph before the public eye. Let the most charming pictorial photograph be produced to-morrow, such as would be worthy of a place on the wall of any dining-room or library, and the photographer might not sell a copy of it, for all the opportunity he gets of making it known. And now that we are producing our prints in permanent pigments instead of silver, we have some right to cry out for better opportunities for publicity. Now and then one sees a picture of Robinson, Rejlander, or Stuart Wortley exposed to view, it is true, but this only proves how seldom the public get a peep of photographic works. It is little use anyone striving to produce fine pictures if there is no organisation for selling them, is an argument that has been used over and over again; and we are bound to admit that there is a good deal of truth in it.

Chemical Notes in Rhyme.—A clever little work has been placed in our hands, which it will not be out of place to mention here. It is called "Discursive Chemical Notes in Rhyme," and is from the pen, we are told, of a Fellow of the Royal Societies of London and Edinburgh. It is written rather for the scientific world than for the public generally, as digressions here and there concerning the popular chemists of the day would scarcely be appreciated by any who had not some knowledge of these gentlemen. But the greater part of the book is taken up in an endeavour to turn into tuneful rhyme the reactions of various elements, and to tell off their symbols and equivalents in verse—a very difficult task, some of our readers will say, when they call to mind the crack-jaw names and outlandish terms which chemistry makes us familiar with; but the author nothing daunted at the difficult task he has set himself, does not desist till he has successfully bent the stubborn words to his purpose. Balard, the late president of the French Photographic Society, is thus happily referred to as the discoverer of bromine:—

> "Bromine exists, in quantities minute,
> In 'bittern' from the water of the sea;
> Balard, the Frenchman, with a mind acute,
> Thought, in this brine, an element might be,
> Not isolated yet; and he was right:
> Under his hand was bromine brought to light."

And the author further tells us, in reference to this same element, that—

> "Bromine is liquid, reddish, brown, and weighty,
> Br its symbol, and its value eighty."

All the non-metallic elements are treated of in this little work, together with their combinations. Many a photographer who has burnt his fingers making vignettes by means of fluorhydric acid will hear the author out when he says:—

> "This acid, so they say, the skin assails,
> And gives a painful sore about the nails."

That no water but that which has been carefully distilled should be used in delicate processes every photographer knows, and he is reminded of the impurities which ordinary water contains, by the couplet:—

> "The snow of winter and the summer rain
> HNO_3 and NH_3 contain."

We should mention that the pamphlet is published by Van Voorst, of Paternoster Row; and although it is scarcely designed for teaching chemistry, it is singularly accurate in its science, and serves well enough, therefore, to jog one's memory from time to time.

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THE PARIS PHOTOGRAPHIC EXHIBITION.

[FROM OUR SPECIAL CORRESPONDENT.]

The landscapes at the exhibition may be dismissed in a few words. The cultivation of landscape photography in Great Britain is due to the large number of gentlemen amateurs who make this branch of the art their particular study, and these are not met with in such numbers abroad. Indeed, I believe there is not a single amateur landscape photographer exhibiting this year at the *Palais de l'Industrie*, certainly none of any note, while with us more than half of the exhibitors in this department would have been amateurs. M. Braun exhibits a solitary Swiss landscape, the palm being carried off, to my thinking, by Johannes, of Partenkirchen, in Bavaria, whose name as a clever landscape photographer is well known, and who shows some fine fifteen-inch pictures of the Tyrol. M. Unterweger, of the Austrian Tyrol, sends also some good mountain views of the same kind. M. Delarché, of Compiegne, shows some difficult subjects treated in a masterly manner, the Bridge at St. Sauveur, in the Pyrenees, being perhaps the finest of his series. M. Delon, of Toulouse, contributes an album of photographic sketches of the Pyrenees, among which is to be seen some creditable work, notably the Bridge near the Eaux Bonnes. De Bray, of Nice, sends pictures of tropical landscapes, an aloe in a garden being well rendered, as also a charming glimpse that is given of the garden of Monte Carlo. The Autotype Company exhibit a New Zealand landscape, and M. Rey some picturesque ruins in North Syria. Guipet has a numerous collection of landscape and architectural subjects taken near Dijon; M. Schulz, of Dorpat, in Russia, sends some pictures of Livonia; and M. Relvas, of Gollega in Portugal, also several fine pictures. Finally M. Knebel, of Sabaria in Hungary, forwards a series of eight landscapes and picturesque scenes, which are among the best things in the exhibition.

Enamels are exhibited by M. Deroche and MM. Gougenheim et Forest. Some of the specimens are creditable, and free from that hardness and fuzziness, if I may use the word, which spoils so many of these productions; but none of them are in advance of those which have been shown already by such men as Lafon de Camarsac, Mayland, H. P. Robinson, Henderson, and others.

One exhibitor, M. Geldmacher, shows some printing upon linen, cotton, and other fabrics; the pictures, he tells us, are the products of a process of his own discovery; but since they are considerably inferior to what I have seen yearsago of this nature, one is not curious as to the details of the invention.

Mr. York, of London, sends some of his well known transparencies of animals, and Mr. Hedges, of Lytham, also forwards similar studies; but as the latter are skied, it is quite impossible to examine them. M. Quinet and M. Schodisch likewise send some clever studies of animals. M. Levy, of the Boulevart Sebastopol, shows some of his unrivalled glass stereoscopic slides, and MM. Lachenal et Favre also exhibit a lot of pictures of the same nature. M. Truan, of Gijon in Spain, exhibits several glass vases with photographs vitrified upon their surface, as also some with carbon photograph affixed to them.

M. Terperau, of Bordeaux, shows a series of maritime pictures of large size, one or two grand views of ships in harbour being particularly striking.

The British exhibitors are but six in number, Captain Abney, Mr. De la Rue, Mr. York, Mr. Hedges, Mr. Cooper, and the Autotype Company.

In the matter of printing with greasy ink there is a very formidable array of exhibitors. Their names are Arosa, Rousselon, Thiel ainé, Vidal, Scamoni, Rodrigues, Brusa, Fleury Hermagis, Franz, Fortier, Geymet, Gillot, Relvas, Jacobi, Nunes, Quinsac, Rothschild, and the Autotype Company. Most of the pictures exhibited are reproductions of old engravings and woodcuts, which, as everybody is aware, are more likely to afford successful results in this branch of photography than negatives taken from nature. Nevertheless, many have seized the bull by the horns, and have essayed, with more or less success, to produce portraits and landscapes in fatty ink. Among those who have distinguished themselves especially, may be mentioned M. Rousselon, who represents the firm of Goupil et Cie. Some of the pictures that gentleman exhibits, No. 623 especially, are very fine, being what may be termed photo-engravings. M. Geymet shows some groups, which, notwithstanding their difficult character, are very well produced in greasy ink. M. Arosa's work in the same direction is very creditable, but scarcely so good as the collection by Thiel ainé, whose picture of Notre Dame is a proof of what may now be done in mechanical photographic printing. M. Vidal shows a large collection of pictures printed, so he tells us, by steam machinery, therefore very rapidly, and without the care which hand-printing permits the operator to exercise. M. Scamoni has a large collection of reproductions of all kinds, for the most part executed with rare skill and perfection, demonstrating clearly that the Russian State Paper Office is exceedingly fortunate to have such a practised photographer as M. Scamoni in this department. M. Rodrigues, who is evidently in Portugal what M. Scamoni is in Russia, has also some fine examples of greasy ink printing, the results being produced from phototypes and from photo-engraved plates. He shows us the plates themselves of copper and steel, with the designs delicately etched or engraved upon them. M. Brusa, of Venice, exhibits a good collection of greasy ink prints representing views in Venice, taken by the camera; M. Franz, of Vienna, shows reproductions of old and modern masters, produced by various mechanical processes; and M. Fleury Hermagis, of Paris, exhibits some coloured specimens, as also several photo-chromo lithographs. M. Fortier sends specimens of phototype. M. Gillot's pictures are some of them rather rough and blotchy, but he had a large collection, and in many of the prints he has certainly been successful. M. Quinsac, of Toulouse, is again another whose work deserves especial commendation, many of his subjects from nature being exceedingly well treated. M. Relvas shows good work, also M. Jacobi of Berlin, M. Nunes of Lisbon, and Rothschild of Paris. Altogether the collection is a most valuable one, as showing the extent of progress which this most useful branch of the art has attained. Never has such a fine and varied collection of prints in greasy ink been brought together, and although, as every spectator must acknowledge, there is much still to be done before photo-mechanical printing becomes perfect, still the best pictures here speak highly for the efforts which must have been made to bring the process thus far. That there are no particular difficulties to be encountered in greasy ink printing is proved by the many exhibitors, but great skill is evidently required before perfection can be reached. As in engraving and lithography printers are not born, but have to be trained and educated, so it is with photo-mechanical printing. A man must be specially employed on the work for some time before he can secure the most favourable results.

I had almost forgotten to speak of M. Vidal's photochromes, of which specimens are exhibited, and now the subject comes to my mind I hardly know what to say. Some tiny green pamphlets, lying invitingly near the coloured photographs, profess to give the public an account of these photo-chromes, and herein we read of the earlier attempts to fix colours in the camera made by Becquerel, Niepce de St. Victor, and Poitevin. Thence we get by easy stages to M. Vidal's complete solution of the problem. Does M. Vidal want us to believe that he has followed up the experiments of these great philosophers, and has really succeeded in doing what they failed to accomplish? I should like to know this very much, because if the coloured portraits M. Vidal exhibits are in truth the work of sunbeams and nothing else, they are the most wonderful photographic productions that have been seen for many a day; but if, as I fear, they are simply chromo-lithographs, or a modification of these, covered with a photographic film, then I for one fail to see any novelty in the productions at all; and I cannot help thinking that it is scarcely fair to such of the public who are ignorant of photography to let them suppose the pictures are obtained in any other manner.

In conclusion, I have to thank the Administration of the Paris Exhibition for a card, entitling me to enter the Exhibition during my stay in Paris, which was kindly given me by the acting secretary, M. Koziell.

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ON SOME NEW FACTS IN SUPPORT OF DR. VOGEL'S COLOUR THEORY.

BY CAPTAIN J. WATERHOUSE, ASSIST. SURVEYOR-GENERAL OF INDIA.*

While recently continuing my experiments with reference to the photographic effect of the solar spectrum upon stained dry collodio-bromide films, I have obtained some results which go far to prove the correctness of Dr. Vogel's theory, and may therefore be of interest to the members of the Photographic Society.

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* Communicated to the Photographic Society of Great Britain.

When I first commenced my experiments I found that Dr. Vogel's theory did not hold good for the blue dyes, at any rate for the only available specimens of the aniline blues I could obtain here, the results obtained with such dyes being almost identical with those given by yellow or orange dyes; and although plates stained with them proved sensitive for the whole spectrum up to A, they showed no marked *increase* of sensitiveness whatever for the yellow and orange rays which they absorb. The only exception was with a dye called "green," but which is really a blue or violet.

Dr. Vogel has favoured me with a sample of a blue dye which shows a most marked sensitiveness for the orange rays. This dye, cyanine blue, when dissolved in alcohol, gives a spectrum showing a very strong absorption for the yellow and orange rays above and below D, being stronger for the orange below D than for the yellow above it, the strength and extent of the absorption varying, as usual, with the strength of the solution, both towards C and E. On the photographic plate we find a most intense action in exactly the same part of the spectrum, the strongest effect being below D towards C, which also corresponds precisely with the character of the absorption-band. Below C there is no action, nor is there any action in the green; and in the blue and violet regions from H nearly to F the action is very faint indeed. On one of my plates, possibly stained rather strongly with the dye, there has been no action at all on any other part of the spectrum but the orange and yellow. The fact that in this case photographic action is confined exclusively to the part of the spectrum absorbed by the dye shows, I think very conclusively, that the absorptive power of the dye exerts a very important influence on the photographic action.

Dr. Vogel also has noticed that the aniline-blue dyes form an exception to this rule, and attributes it to the fact that the dyes in question do not act powerfully enough as reducing agents, or do not combine easily enough with iodine or bromine. Having the other day to refer to Beale's "How to Work with the Microscope," I found in the appendix a statement to the effect that Mr. Sorby had observed that a certain organic blue substance obtained from an aquatic plant found on stones in stagnant pools was the only blue liquid that gave him definite absorption-bands. It struck me that it was not impossible that the failure of the aniline-blue dyes to show increased sensitiveness to the yellow and orange rays might be partly attributable to the fact that although these dyes strongly absorb the regions of the spectrum about the yellow and orange, they do not show a clearly marked absorption-band in weak solutions. I am the more inclined to think so because I have found that in other respects the blue dyes behave very well as sensitizers—*i.e.*, they yield images of a very good character as regards intensity and brilliancy. On the other hand, cyanine blue shows a strong and well-marked absorption-band, but does not act well as a sensitizer, being apt to produce fog. I have also noticed that the peculiar bands of increased photographic action observable on plates stained with dyes of different colours are almost invariably most distinctly marked on the plates treated with dyes showing strong absorption-bands, and that other dyes, though apparently well suited to act as sensitizers for a dry bromide film, do not produce the desired effect unless they show a strongly marked absorption of the spectrum. Fluorescent dyes also seem particularly suitable for exhibiting these effects; and the absence of well marked fluorescence in blue fluids may also have a bearing on the unsuitability of most of the blue dyes to produce the increased intensity of action in the yellow and orange.

In the absence of proof of the actual cause of this unsuitability of the blue dyes, this explanation appears not improbable, for the reasons I have given; but it is, however, only a conjecture, and further investigations will be necessary before it can be accepted. I should not put it forward now had I the means of making further inquiry into the facts; but the difficulty of ascertaining what substances would be most suitable for experiment and of obtaining them here, as well as the very little leisure at my disposal for carrying out such inquiries, render it impossible for me to expect to obtain more definite results, at any rate for the present.

Another point on which I thought that Dr. Vogel's theory seemed scarcely borne out by results was, that plates stained with dyes showing two or more absorption-bands, such as eosin and naphthalin red, did not show a corresponding rise of sensitiveness or intensity in more places than one. I have, however, quite recently obtained photographs of the spectrum on dry bromide plates stained with a watery solution of carmine, showing two very distinct bands of increased action in positions corresponding very closely indeed with the absorption-bands of the dye.

A weak solution of carmine in water containing a little ammonia shows two well marked absorption-bands—one very strong, between and about C and b; the other not so strong, between E and D, at a point at the end of the green just above D. There appears to be also a third weak band about F. The photograph shows two well marked bands of increased action, one immediately above E and the other just about D; both bands are therefore slightly lower in the photograph than they appear in the spectroscope. The most intense action is in the blue and violet region, extending from H nearly to F; then there is an abrupt decrease of intensity, and the photographic action continues very gradually decreasing to about B, with the exception of the two bands of increased action above noticed.

This result, with that obtained with the cyanine blue, shows that, although the chemical constitution of the dyes may influence the results, there is no doubt that the peculiar increase of sensitiveness shown by the stained bromide of silver is intimately connected with the optical properties of the dye used, as exhibited by its absorption spectrum, and thus fully bears out the theory proposed by Dr. Vogel, if it does not absolutely prove it.

In the very interesting and suggestive paper read by Captain Abney at the March meeting of the Photographic Society, that gentleman expresses the opinion that the dyes combine with the silver and silver bromide left in the films to form compounds of a resinous nature, and that these organic silver salts are sensitive to the red or other rays, as the case may be, and that the effect of the addition of the dyes to the film is to cause sensitiveness in the film, owing probably to their chemical composition rather than to their colour.

Now, although I agree that the mere colour of the dye has little influence in increasing the photographic action of the less refrangible rays upon a film of bromide of silver (because a film may be stained green without showing any increased sensitiveness of the plate for the red rays, and *vice versa*, or blue without increasing the sensitiveness for the yellow and orange rays), the results I have mentioned above and others show, I think, very conclusively, that the increase of sensitiveness is not dependent only on the chemical constitution of the dyes. Most of the stained plates seem more or less sensitive to the more refrangible rays of the spectrum; but as regards the less refrangible I have met with very few, if any, cases of what may be called abnormal action, if Dr. Vogel's theory be assumed as correct; and, as far as my experience goes, I have never found a dye giving greater sensitiveness for the less refrangible rays principally transmitted by it than for those absorbed by it. Captain Abney does not appear to have considered the photographic effects of the dyes with reference to their absorption-spectra, which is really the point at issue, as far as Dr. Vogel's theory and results are concerned, and is only indirectly connected with the question of extending photographic action into or beyond the visible red.

Dr. Vogel and Mr. Carey Lea have both found that this extension of action can be obtained by treating the bromide film with colourless organic substances, such as tannin, salicin, and other dry-plate resensitizers; and, although I have not paid much attention as yet to this part of the question, my results agree with theirs. Dry bromide plates, plain and treated with tannin and salicin, have all shown a prolonged direct action in the region of the red and ultra-red; but the action is faint, and I have not succeeded in obtaining distinct lines. Plates stained yellow or orange with annatto have given me good intensity with lines (direct) as far as A, and one line below, at about the same distance as *a*, with a faint continuation, the limits of which are difficult to follow. The tannin and salicin plates also show faint traces of action prolonged, I should say, to the extent reached by Captain Abney; but I have not worked with these sufficiently to speak positively. Captain Abney's method of obtaining not only the very great extension of action in the ultra-red, but also the intensity sufficient to render the lines distinct, is undoubtedly a very important advance, and one which will be of great value in spectroscopic observation; but Captain Abney will perhaps pardon me for thinking that the results he has obtained are not altogether sufficient foundation for his belief that the sensitiveness caused by the addition of the dyes is due principally to their chemical constitution. Further evidence is, I think, also required to show that resinous substances are produced under the influence of light upon bromide of silver as it exists in a well washed plate, by the action of the many colouring matters, both aniline compounds and others, which have been successfully experimented upon both by Dr. Vogel and myself; and it would be particularly interesting to know if these resinous compounds are formed in the case of the dyes which show the bands of increased intensity, and not in the others.

ANTIMONY PHOTOGRAPHS.

Mr. Spiller writes to the Journal of the Photographic Society as follows:—

"Since communicating my 'Note on the Production of Antimony Photographs' at the April meeting of the Society, I have been in further correspondence with Mr. Francis Jones, of the Manchester Grammar School; and that gentleman has been kind enough to give fuller particulars of his mode of working, some of which may prove interesting to your readers.

"In the first place I have to correct a misapprehension relative to the degree of sensitiveness of the process, which is far greater than I had represented; for Mr. Jones now tells me that he has 'obtained photographs as dark as any of those exhibited by an exposure of from 30 to 60 seconds,' the depth of colouration depending, of course, upon the strength (or purity) of the gas and the brightness of the sunlight at the time of experiment. Upon this assumption it might even be possible to utilize the reaction as a camera process; but as yet we have made no experiments upon this point.

"The inventor prefers to regard his process as a mode of obtaining *red* photographs for special purposes, and does not attach any importance to the possibility of toning them by the subsequent application of metallic solutions. In answer to my direct inquiry, Mr. Jones states that photographs have been taken from glass negatives; but the details do not come out so clearly as by the silver process. Moreover the sulphur on the paper attacks the silver of the film after one or two prints have been taken from the negative. He sends me a photograph, showing a certain amount of half-tone, which was printed from an unmounted photograph laid in contact with the prepared paper, and then submitted to the action of the antimonietted hydrogen gas.

"In copying ferns it is immaterial whether the gas be led into the pressure-frame *behind* the prepared paper, or conducted to the *face* of it by means of a small glass tube. The first-named method will be found on the whole more convenient, but will necessarily take a little longer to allow for diffusion. In all cases it is advisable to dry the gas by interposing a chloride of calcium tube between the generator and printing frame, and the gas is led directly into the latter through an aperture at the back connected with a flexible tube.

"Lastly, Mr. Jones prefers the use of unsized paper, as permitting of a more uniform impregnation with sulphur when moistened with the disulphide solution.

"On my own account I have only to add that these particulars are given more with the view of encouraging further experiments with a newly observed solar reaction than with the view of detailing a readily available process for immediate adoption by practical photographers; and this point was, I feel sure, made clear to all attending the meeting."

ON THE PREPARATION OF SENSITIVE DRY PELLICLE FROM COLLODION AND FROM GELATINE.

BY COL. H. STUART WORTLEY.*

I now proceed to the formation of pellicle from gelatine. There has been so very little reliable information given as to the formation of pellicle from gelatine that each one has to take a line for himself, all of us, however, taking the starting-point of Mr. Johnston's letter, in which he first suggested the formation of a pellicle. This publication fortunately prevents there being any patent rights to bar the way, and the manufacture and use of gelatine pellicle is free from trammels. My method of working is as follows:—In a small German beaker I dissolve 40 grains of bromide of ammonium, or the same proportion of any other bromide, and 20 grains of gelatine in 12 drachms of distilled water, and when dissolved, I pour it into a bottle; this bottle must now be heated in hot water till the temperature of the contents is about 180°. Seventy grains of silver having been previously dissolved in 4 drachms of water (and kept hot in another small beaker), is added little by little to the hot gelatine in the bottle. The bromide of silver will be immediately formed; and in order to prevent any excess of silver remaining in the emulsion, 2 grains of bromide of ammonium dissolved in 10 minims of distilled water are added after the whole of the silver is in. I also then add 20 to 30 more grains of gelatine, according to the sample of gelatine that is used; and the emulsion being well shaken every two or three minutes is, after standing for a quarter of an hour in the hot water, to be poured out from its bottle into a glass dish, in order that it should become solid. Ten grains to the ounce of nitrate of uranium add greatly to the keeping qualities of the emulsion. You will notice that I make a considerable alteration from any instructions that have hitherto been given for the preparation of gelatine emulsion, as I work at an exceedingly high temperature, with the object of forming my emulsion at once, instead of spreading the formation over many hours, as I believe other workers do. I get the most perfect films by this method of working; and I am certain that the above temperature has no injurious effect whatever on the gelatine; while the time that I save, and the certainty that the emulsion is perfectly made, are great advantages. When the pellicle is "set" in the dish into which it has been poured, it is cut up with a clean slip of glass and put into a bottle; it is then rapidly rinsed with three or four changes of distilled water, and then with two changes of methylated alcohol, in the latter of which it is allowed to soak for a quarter of an hour: it may then either be taken and, after blotting off the superfluous moisture, be dried by a gentle heat, or it may be left in a bottle with clean alcohol, which I find to be by far the best method of preserving sensitive gelatine pellicle; and under any circumstances, if it is desirable to make the pellicle into a dry substance, the two washings of alcohol are most important, as they extract all the water from the gelatine and render it far easier to thoroughly dry the pellicle. I also find the diluted alcohol useful in the preparation of the collodion pellicle; but I need hardly point out that in that case it must not be used too strong, or it would cause partial solution. With regard to the making of plates from this gelatine pellicle, I have little to remark, as the gelatine simply requires to be dissolved in warm water, the amount of water being regulated by the thickness of film required. The amount of two ounces specified in my formula makes about four or five ounces when diluted. With regard to the method of making pellicular films ready for exposure in the camera, I am meeting with most encouraging success in that direction, and I trust that if the subject should be thought of importance to our members, I may find an early opportunity after our reunion of bringing the results and formulæ for pellicular films before you. The pellicular sensitive film can be made any thickness; and I show you here two strips cut from the edges of two prepared films to show the thicknesses I most commonly use. I had intended to have brought you some large prepared films to see to-night; but unluckily my laboratory assistant, not knowing of my intention, used them all yesterday in the course of experiments, and I could only bring the edges which happened to have been cut off, a piece being always kept of each large film for reference.

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* Continued from page 293.

I have brought several negatives to show you, taken on pellicle films without any glass being used; and they will show you the quality of film to be produced by the "bath emulsion" process as above described, and also from gelatine. They do not profess to be mechanically perfect, as they are merely to be taken as the result of my experiments, and are not prepared with that amount of care to avoid dust, &c., that would be taken if one wanted perfect negatives. I may here mention that I have used the dish without bottom recommended by Mr. Warnerke to develop my films, and thus obtain great ease of manipulation. I will show now two pieces of apparatus which I find to be of great use in obtaining reliable comparative results in the exposure and development of various kinds of dry plates. I test all dry plates by means of this actinometer (which I have here, as well as a test plate from it), the plate being placed in contact with it always at a stated distance from a standard gas-burner, and developed with a standard developer. Test work with this actinometer is very reliable, not only for rapidity, but also for density, and other qualities of a negative. It has shown me conclusively that collodion films can be made quite as sensitive to dull light as gelatine is, and, indeed, more so, as they are far more manageable under the developer. In order to do away with any difference from the evaporation of ammonia during the application of the alkaline developer, I have had this other piece of apparatus constructed. You will notice that I open it completely and lay the plate in it; I then close it, the india-rubber all round making it water-tight. With a funnel I then fill the well at one end, and when I tip it up the solution runs over and remains on the surface of the plate. For use in the open air, I put two little windows of yellow glass on the white ones, and, as there is a drainage hole at the opposite end of the well, I can develop, fix, and wash my plate in the open air.

I will now close by saying that what I have now laid before you is the result of long and patient work. I am not one of those who rush hastily into print with crude and imperfect formulæ, but I work my test over and over again before I venture to give formulæ to the public. I claim, therefore, from those who try these processes, intelligent and fair criticism. I do not profess to write for the small ring who see nothing good in any thing not devised or suggested by themselves, but for those who, with an honest desire for progress, will always be willing to give attentive consideration to the researches of others.

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A SIMPLE BEER PROCESS.

BY SELIMO BOTTONE.*

I have been so successful these last two months in procuring brilliant and rapid negatives by the aid of the beer-process that, although I have previously called attention to the excellence of this process, I feel that I shall be doing quite right in stimulating others to work with the same process, which is as simple as it is trustworthy, and quite as sensitive as any dry plate process which I have as yet tried. My method of manipulation is the following:—

Having cleaned my glasses with oil of vitriol rubbed over them with a cork, and subsequent rinsing in plenty of water, I dry them off on a soft old diaper, finally polishing them with a silk handkerchief kept *ad hoc.* I then proceed to collodionize with any fairly bromo-iodized collodion (I have lately used Stanley's), and immerse in a 35-grain bath. The plate should be left there till it becomes fully saturated with silver, say, at least, five minutes. It is then to be removed, and washed under a stream of ordinary water, until no metallic taste is perceptible when a drop is allowed to fall from the plate on the tongue. The plate should then be immersed in a bath containing nothing but pure undoctored porter (containing no iron), where it may remain for five minutes. On emoval from this bath it should be thoroughly washed, until all smell of the beer has disappeared, when it should be placed in a drying box or oven, the temperature of which does not exceed 100° C. (212° Fahr). A rather thick pad of blotting-paper should support the lower corner of the plate, to absorb the drainings and facilitate drying. I find that the quicker I can get my plates to dry off the more equal is the intensity of the resulting image. When the plate is thoroughly dry I hold it horizontally in my hand, and go rapidly round the edges with a brush dipped in ordinary negative varnish. This effectually prevents the peeling or splitting of the film in the after operations of developing, intensifying, &c. As a rule I prepare my plates at night, working by candle-light covered with yellow paper, and dry off the plates in the common kitchen oven, in which I have placed a wooden rack to support the plates. After having been "tipped" with varnish, the plates can be put away in light-proof boxes, for use. They appear to keep indefinitely (for I can find no deterioration in plates prepared more than a year ago), provided they may be carefully protected from light. The exposure to be given will depend entirely on the nature of the developer afterwards used. Thus with the ordinary iron developer and pyro-intensifier, about four times the exposure necessary for a wet plate is sufficient for a beer plate; but if the alkaline development be practised, the exposure may be as short as for an ordinary wet plate. However, I never use the dry process for instantaneous pictures, where animals or moving objects are concerned; so I seldom use the alkaline developer, as I find the iron gives finer gradations of tone, and my subjects allow me to give as long an exposure as I may require. After having exposed my plate I flood it with hot water (nearly boiling), and when this flows freely, I immerse it in a silver bath, containing twenty grains to the ounce. It is left there until the bath flows quite evenly over the surface, when I proceed to develop with the following solutions:—

Protosulphate of iron ...	... 240 grains
Water	4 ounces
Acetic acid	2 drachms

When all the detail is well out, the image may be intensified as usual with an acid pyro-solution. I may state, in conclusion, that I have not had more than two or three plates turn out defective in as many hundreds.

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* *English Mechanic.*

The Photographic News.

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THE PATENT IN GELATINE PELLICLE, AND THE RECENT DISCUSSION.

Somewhat less than five minutes' discussion at a recent meeting of the Photographic Society has given rise to further controversy outside the Society. In the course of a very admirable and interesting paper, Colonel Stuart Wortley took occasion to remark that there were no patent rights to bar the manufacture of sensitive gelatine pellicle by the public at large. The presence in the meeting of the patentee of sensitive gelatine pellicle, and the fact that at the close of the paper the Chairman called upon this gentleman, asking him if he had anything to say on the paper just read, led very naturally to an incipient discussion upon the patent question, and just for a moment the atmosphere began to get disturbed with the presage of a storm. The most prominent thought at the time in Mr. Kennett's mind was, doubtless, the attack upon his patent, and when called upon by the Chairman it was most natural that he should regard this call as an invitation to vindicate the patent, the legitimacy of which had just been called in question. The Chairman very promptly stopped any discussion upon the patent claims as being quite outside the recognized purpose of the Society and its meetings, and the matter quickly subsided. Several letters on the subject have, however, reached us since, both on the question of the patent and on the discussion of such questions in Society meetings.

Much can be said on both sides of both questions, but we have no intention of pronouncing *ex cathedra* on either subject. It was, we think, at least unfortunate that a practical challenge to Mr. Kennett was thrown out in a meeting the recognized rules of which prohibited him from making any reply, and it was unfortunate that the fact that such a challenge had been made did not occur to the Chairman's mind when he asked Mr. Kennett if he had anything to say on the subject of the paper. As the matter stood, Mr. Kennett was certainly placed in an uncomfortable and scarcely fair position. Regarding the question of discussing subjects bordering on professional interests connected with photography, it is unquestionably the recognized rule at present to taboo such questions in the meetings of all scientific societies. In photography, it must be admitted it is at times difficult to deal with the practical questions associated with the progress of the art without more or less reference to personal interests, and there are doubtless questions connected with the general subject of copyright, patent right, &c., as a recent correspondent pointed out, which, although connected with the commercial phases of photography, may need discussing, and can only be satisfactorily discussed by such a body. In America, the National Photographic Association distinctly includes in its aims opposition to unjust patent claims, and action in various ways affecting the professional interests of its members. Until such a subject has been definitely considered by the council, and a change resolved upon, we can only hope that all allusions to such subjects will be carefully abjured alike by readers and speakers.

Regarding the immediate patent question out of which this discussion arises, we cannot be expected to offer an opinion. All the learning and wisdom of a Chancery judge acquired in a lifetime devoted to such subjects is often severely tested in deciding upon disputed patent questions. If the case in question ever come before a Chancery court, many hours—possibly many days—will be expended by gentlemen learned in the law in discussing its merits before the Vice-Chancellor gives his decision. Hence, a hastily-expressed lay opinion in either direction can possess little value. Colonel Wortley, in a letter in our pages, gives apparently cogent reasons why the patent cannot stand. He gives the previously-published details of making a gelatine emulsion and washing it, the process proceeding *pari passu* with Mr. Kennett's up to that point But we are bound to point out that there the previous publication stops. No mention is made of forming and preserving a sensitive pellicle; probably no such thought entered the mind of the experimentalist. It may be a small step to desiccate this washed emulsion, and so render it capable of being kept indefinitely in a sensitive state, capable of being made ready for use in a few minutes; but it is a step. It is probable that the same idea would eventually have occurred to the minds of others using such emulsions; but there is no record that it did occur to any one before Mr. Kennett. As another correspondent points out this week, Mr. Kennett produced a new thing which had not been heard of before, and this has been regarded as the essence of a patent claim. But whether the one definite step conceded to Mr. Kennett, and the new and really valuable thing he has absolutely introduced to photographers, admit of protection by patent is a question which can only be satisfactorily decided by legal authority. We have urged a recognition of facts which have been in danger of escaping attention in the present state of the controversy, and which Col. Wortley, in his zeal for the rights of the community, seems to have overlooked.

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THE PHOTOGRAPHIC EXHIBITION IN EDINBURGH.

The conditions for the guidance of exhibitors at the exhibition to be held in Edinburgh next winter have been issued, and will be found in another column. The exhibition will not be opened until December next, hence it will be seen that the Society is taking time by the forelock in making and announcing its arrangements thus early, and full time will be afforded to all photographers to utilize the summer's work in preparing pictures for the exhibition.

It will be seen, from the list of medals announced, that there is no lack of inducement to contribute offered to all who are interested in competing for honours, whilst opportunity is afforded to those who disapprove of medals to send in pictures *not* for competition. The decision to offer medals was not arrived at without considerable earnest debate. It is a subject upon which much can be said *pro* and *con*. We have often maintained the advantages of the system of awarding prizes. Theoretically we hold the conviction that it is legitimate and desirable. Emulation has always been found a valuable stimulus in securing excellence. A star, a medal, a ribbon, a decoration, any form of distinguished insignia which proclaims that honours have been won, has beyond a question proved an incentive amongst mankind to the effort which is worthy of honour, and the question legitimately arises, Why should a system good and justifiable in itself become evil in relation to photography and amongst photographers? The question is not easy to answer. The principal argument we have heard urged against it is that it begets heart-burnings, jealousies, and dissatisfaction. That in all competitions some disappointments should arise is inevitable. Where a race is run there can be but one winner, and the possession of the will to compete implies the capacity of disappointment on failure. But disappointment need not involve jealousy, heart-burning, or animosity; and that it has done so in connection with some photographic exhibitions cannot, unfortunately, be doubted. When such feelings are engendered, the result is deeply to be regretted, and is often as much regretted by the successful as the unsuccessful competitor. We have heard a prize-taker exclaim, "I would willingly have surrendered my medal rather than have caused or seen such an exhibition of disappointment and petty vindictiveness." A good system may fail to work well if applied under adverse conditions, and issues have arisen in connection with some exhibitions which might render even staunch advocates for the competitive system gravely reconsider the wisdom of offering prizes in future.

Our Edinburgh friends have, however, in offering a liberal and very judiciously considered series of prizes, decided on conditions which must tend largely to remove the risk of jealousies and suspicions. In the first place, they have, with a rare unselfishness, resolved that photographers resident in Edinburgh, whether members of their own society or not, shall be ineligible as competitors; and further, they have decided that a majority of the jury appointed to award prizes shall be selected outside of the Society. It will be seen that the utmost precaution is here taken to check the tendency unfortunately present in some little minds to suspect motives, and attribute their own failure to partiality in the judges. When the majority—the dominant power in the making the award—is chosen outside the Society, and the competitors, instead of including local photographers, are all strangers sending from a distance, it will be difficult indeed to allege the influence of *camaraderie* in the distribution of prizes, and the most conceited and cantankerous of failing competitors will scarcely find a peg to hang an objection upon, or a ground for suspecting that favour, not merit, will secure medals. It is true that objection might not unfairly be taken by members of the Society, by whom it might be urged that those from whom the enterprize, effort, and cost of the exhibition must emanate, might legitimately enter the arena of competition, or, failing that, giving up the chance of medals themselves, some members of their own body might at least be supposed to form the most fit and capable judges in distributing the medals the Society itself provides. It is, however, clearly an act of great uselfishness to give up legitimate privileges, so as to avoid the shadow of objection; and we heartily hope it will secure its reward in the extent, completeness, and excellence of the contributions, and we bespeak amongst photographers generally an effort to respond worthily to the invitation to contribute and make the Edinburgh Exhibition one of the best which has ever been held, not only in the modern Athens, but in the world.

PHOTOGRAPHY AT SOUTH KENSINGTON.

On Saturday evening last, Captain Abney, R.E., F.R.S., F.C.S., &c., delivered a lecture upon photographic printing processes before a very numerous audience. The lecture was one of a series given in connection with the Loan Exhibition of Scientific Apparatus, and was in some degree an explanation of the objects shown in the photographic department of that collection.

Captain Abney briefly explained to his audience the various processes at present employed, touching upon silver, carbon, proto-relief, and collotype printing. He was able, as a matter of course, to say but a very few words about each, and he wisely confined himself to mentioning the main points which distinguished one from the other, using clear, popular language, such as the least scientific of his audience could readily understand. He dwelt upon the progress that had been made in producing photographs of a permanent character, and showed his audience exactly how far the photographer can assist the publisher now-a-days in the matter of book illustration.

Every process, as it was brought forward, was practically demonstrated, and the audience had the gratification of seeing a carbon print developed and a picture printed by the Woodbury process before their eyes. Examples of greasy ink printing were freely passed among the audience while the lecturer pointed out the value of such productions, Captain Abney finishing an hour's pleasant chat by referring to some fine examples of mechanical printing upon the walls. It was fortunate that the lecturer spoke in distinct tones and in measured sentences, otherwise we fear his voice would hardly have penetrated, as it did, to the distant corners of the spacious hall. Captain Abney is certainly to be congratulated on the manner in which he acquitted himself of a very difficult task.

DR. VOGEL'S COLOUR THEORY.

BY CAPTAIN ABNEY, F.R.S., ETC.

I have just read in the Photographic Journal a paper by Captain Waterhouse, in which he notices a communication I made to the Photographic Society in March last. Allow me, through your columns, to thank him for the courteous way in which he combats some opinions I have expressed. When a controversy is so good-naturedly entered into, it is always a pleasure to advance an argument. Let me premise that I am quite open to be convinced as to the truth of the colour theory, and I expressly stated that I have obtained the same indication in stained plates as Captain Waterhouse and Dr. Vogel. So far from not having paid attention, however, to the absorption of the dyes, I have photographed a good many of them. Now, in order to be able to impress a plate with an absorption spectrum in (say) the yellow, it is quite manifest that a plate must be obtained which shall be sensitive to the red as well as to the blue, without showing sudden partiality for one portion more than another. Such plates I work with, and very pleasant they are to deal with, except in the development, which must be felt for more than seen. I have experimented largely with eosine, the same dye with which Captain Waterhouse has obtained such successful results. One suggestive experiment was as follows:—An emulsion of eosine with excess of silver it was endeavoured to form in the ordinary manner, a calculation having been made, which subsequently was corrected by experiment, as to the amount of silver necessary. The addition of silver nitrate to the eosine showed that a combination had taken place; for fluroescence was annihilated, and a crimson colour resulted. An emulsion at first formed, but finally nearly totally dissolved in the solvents of the collodion; but after coating a plate with it, and drying it, no crystallization was apparent, and on exposing it a feeble image was obtained. The method of washing the emulsion evidently could not be carried out, so to a neutral washed emulsion emulsified originally with an excess of silver, quarter part of the "collodio-eosine" was added. A plate coated with this mixture gave a crimson colour, and on exposing it to the solar spectrum, an image of the least refrangible rays was obtained on development, extending from the blue to a line below A (the violet part was not thrown on the plate). An exposure of twenty minutes with a slit ·0015 was sufficient to obtain this result. To the same washed emulsion (collodio-bromide) a small quantity of eosine was added, just sufficient to give the film a pale pink tint, and a more prolonged exposure was given to the same spectrum. Similar results were obtained as those described in Captain Waterhouse's communication to the Asiatic Society. Now Dr. Vogel has expressly stated that a great depth of colour was to be avoided. And yet in the first case the deeply coloured film gave an image prolonged far beyond that on the faintly coloured one.

Is not the probable explanation, that in the one case a silver compound was formed capable of being acted upon by the least refrangible rays, whilst in the second case the quantity of sensitive salt caused by the combination of the minute quantity of silver left in the film was so small as to be almost inoperative to them? Any increase of depth of colour, when the necessary silver was absent, would be absolutely hurtful for those rays which the dye absorbed. If this be so, the colour film is not everything. In Dr. Vogel's last communication to the Photographic News of this month he states that he has found it necessary that the silver bromide should be prepared in an *excess of silver*. An emulsion prepared with *excess of bromide* rendered the action of the dyes inoperative. The logical sequence to this is for what I contend with the first eosine emulsion. I have obtained negatives of a landscape through glass, which transmitted nothing but red rays. With a stereo lens, of five-inch focus and two-tenths stop, a moderate image was obtained in eighty seconds, whilst through a cobalt glass the same emulsion, requiring an exposure of fifteen seconds, gave a good picture.

In the spectrum experiments I used originally to expose the plate to all the rays which could be admitted into the camera. At the present time I place bichromate of potash or a scarlet dye before the slit of the spectroscope, and thus cut off the blue, or the blue, green, and yellow as the case may be.

I believe I obtain better images of the lower end of the spectrum by this method. Perhaps it may be due to the fact that the necessary action is not set up. At any rate, it appears to me that the theory of the prolongation of the spectrum being due to the continuating action of the lower rays is untenable when this method of experimenting is adopted.

I will take another instance of the effect of dyes on the film. These are blue dyes of the aniline series. With these I have experimented, and prepared emulsions with these as I did with the iodine. There was, apparently, no trace of combination of silver with any of them. When the deep blue emulsion was employed, not a trace of a spectrum was obtained, whilst with the light lavender-tinted emulsion an ordinary normal image appeared on development.

At present my experiments are devoted to the more colourless organic salts of silver and iron salts; and now that I have a properly worked train of prisms and lenses of rock-salt, I hope that solar lines far below what I have already here obtained may be surpassed. Already I have utilized these plates to obtain photographs of the red end of the calcium and iron spectra, and others will subsequently be photographed.

Dr. Vogel has apparently obtained the same results in less time than I have with a simply washed bromide film. He is evidently working under conditions more favourable than I am, as this is the least time which I can obtain with moderate exposure on plates so prepared. His process has evidently improved since his controversy with Dr. Monckhoven (see Photographic News, Vol. XVIII. page 364), in which he states this gentleman, to obtain the same results as himself—which apparently was to get down to "A"—should have exposed a hundred and fifty minutes. Now, as the length of spectrum and width of slit that I am using are about the same as those which Dr. Monckhoven employed, and that in one-twelfth part of that time I can obtain the A line, and that Dr. Vogel can obtain the same result under the same conditions in less time than that, it is apparent that his washed bromide films are more generally sensitive than any I have as yet tried. It is almost discouraging.

The first part of Captain Waterhouse's paper I shall carefully digest. If the colour theory and not the mechanical theory be correct, the logical inference is that a black film will be the most generally sensitive. The blackest dye that I have been able to obtain and applied to the film has given no promise of success, owing, I believe, to its non-combination with silver.

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CARBON PRINTING IN SUMMER.

We are indebted to Mr. J. R. Sawyer, of the Autotype Company, for the following hints on summer work with carbon tissue. Mr. Sawyer says:—

As printing in permanent pigments presents some difficulties in the summer time, would you allow me to give a few hints which may be useful during the hot weather?

The special trouble is a reticulation or breaking up of the film, consequent upon the high temperature of the water with which the operations are conducted.

Hints.

1. Make the sensitizing bath as follows:—

Commercial bichromate of potash ...	1 ounce
Liquor ammonia fortis	5 minims
Water	35 ounces

2. Keep the sensitizing bath *cool* by placing rough ice round the tray containing it.

3. Sensitize the tissue overnight, and let it hang in a room from which all white light has been excluded till the next morning—it is better for drying slowly.

4. The water in which the tissue is immersed, previous to its being laid down upon the collodionized plate or temporary support, should be kept cool by having ice in it. The temperature should not exceed 55° Fahr.

5. After placing the transfer paper upon the plates, leave them to dry in a cool place—water the floor if necessary to prevent too rapid drying.

6. Do not allow the collodion used for coating the plates to become too thick; dilute with equal parts of ether and alcohol.

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NOTE ON THE NEW NITRATE OF LEAD AND FERRIDCYANIDE OF POTASSIUM INTENSIFIER.

BY CAPTAIN J. WATERHOUSE.*

It may be of interest to some of the members of the Society to know that I have found the formula recommended by Messrs. Eder and Toth answer admirably to replace the bichloride of mercury as an intensifying agent for the negatives of maps and plans intended for photo-lithography. I have also succeeded in replacing the hydrosulphate of ammonia, when using the lead intensifier, by a saturated solution of bichromate of potash, which produces a very opaque yellow film. The bichromate, however, is liable to cause closing up of the lines. One of my assistants has, however, succeeded well in obtaining a dense black or dark brown film with clear lines by applying to the negative, after treatment with the lead solution, a solution of iodide of iron, which is followed, after a thorough washing, by a solution of permanganate of potash. The most suitable strength of these solutions has not yet been fixed.

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* A communication to the Photographic Society of Great Britain.

Correspondence.

NITRATE OF IRON DEVELOPER.

Dear Editor,—Your kindly written article on the above subject, I think, calls for a letter acknowledging the truthfulness of the observations you have in general made in reference not only to the subject of iron development, but as expressing how genuine and prevalent was the wish of all the early students in the photographic art to aid one another. It was so universal as to acquire the description of "The Freemasonry of the Sunbeam." You and I know that Freemasonry does much to make life pleasant. *Emollit mores*, &c.[*]

But it does not exclude many whose minds are not in accordance with our own. So a quarter of a century since, I found the harmonious interchange of sentiment, with a hope to pile up useful knowledge, was aggressively assailed by some one or other making captious claims, and turning molehills to mountains, in regard to trivial things which had been practised over and over again. I fear it would with little trouble make me descend to write puerilities—which you would, however, decline to print—if I were to record some of my early experiments; and I cannot but ask how it is possible that Captain John Spiller can forget the early use of the proto-nitrate of iron? I will recal to his memory a fact why he should not forget it.

It was my custom for some years to spend a portion of the autumn with the President of Royal Scottish Academy, the late Sir Joseph Watson Gordon. He took me, one morning, to the studio of Messrs. Ross and Thompson, when Mr. Spiller introduced himself to me, showing some collodion plates which had been treated with deliquescent salts. He *then* spoke of the beauty of the positives on glass which I had produced by my means of development with iron, and paid me many compliments. I remember a good and earnest friend of mine once replying in Committee of the House of Commons, "You may pay a compliment without being required to verify it by affidavit;" but I did not think the speaker said other than he thought. Now, writing to you hastily, and confined to bed with an injured ankle—having no reference for the exact date—I have accidentally used the word affidavit, and I should not hesitate to confirm by affidavit that early in 1851 I used the proto-nitrate of iron for positives, and the sulphates of iron for negatives, and that it was my own idea formed by my chemical knowledge. Probably you yourself have often verified what immense differences in application are produced by the most trivial in appearance of modes of operation.

All were anxious then to produce pictures having the minute definition of the Daguerreotype without its unpleasant reflection—and the success was so perfect that the deposit was as brilliant as the dead silver of a silver proof medal, varied down to a perfect ivory-like aspect. Hundreds of beautiful negatives were washed off, and not regarded.

Well, I think I have nothing more to add, excepting to express a wish that your readers will extend to me the kindness which they have before given. There was, in fact, no reason why in after times the Rev. Mr. Lawson Sissons and Mr. Spiller should have published as improvements the use of nitrate of lead and nitrate of potash, when all available nitrates had been previously experimented with, and the undoubted beauty resting with the baryta salt. Hugh W. Diamond, M.D.

PATENTING A GELATINE PELLICLE.

Sir,—I do not agree with the remarks made by your correspondent "Photo Chemicus" about "Patent for Pellicles," which appeared in the News of the 23rd inst., in which he says that this very patent is itself an infringement of another patent. Now if it is an infringement to use Nelson's gelatine for the purpose of making pellicle, it must also be so to use it for making emulsions and other things. But Mr. Kennett does not bind himself to use Nelson's gelatine; he only says he prefers it. The carpenter does not do anything to his glue to make it solid; but if you leave the emulsion standing as the glue, it would get bad before it got dry.—I am, sir, yours truly, G. Smith.

THE COMING EXHIBITION IN EDINBURGH.

Sir,—At the meeting of the Edinburgh Photographic Society, last December, Mr. Asher read a paper on "Exhibitions a Stimulus to Advance True Progress in Art-photography." I was much pleased with the tone of the paper, as well as interested in the remarks made by the members present. And now I am glad to know that we, who live in the North, are likely to have an opportunity of examining the progress of the art for ourselves, and, if I understand the Southern nature aright, your readers who dwell south of the Tweed will not grudge us the privilege, but will rather add to our pleasure by sending some of their best productions to grace the walls of the exhibition rooms.

I quite agree with Mr. Asher that exhibitions are fitted to advance the art side of photography; for where the highest efforts of leading men, either in the profession or out of it, are grouped together under circumstances favourable for comparison, it must necessarily follow that photographers who examine these works will in some measure embody in their own labours the excellences seen in them. I hope, therefore, that the Society will be supported by those gentlemen whose works have gained for them a name both at home and abroad, if it were for nothing else than to free us Scotchmen from having too high an opinion of our own powers.

Your readers may say, however—and, I admit, with some show of truth—that the reference made to M. Salomon's pictures at the meeting referred to, and the "sponging" ordeal through which these stern Caledonians made his picture to pass before they admitted his right to a high position in the art, was rather a doubtful way of securing contributions for next December, and that, should they send their pictures to Auld Reekie, there is no guarantee that the prints may not be boiled before returning South. Should such a thought flutter through some nervous great man's mind—for geniuses are generally nervous—let him be assured that no such catastrophe is likely to overtake his beautiful pictures. The members of the Edinburgh Society have learned wisdom in these past years, and are, no doubt, prepared to criticise French and English work in a spirit more becoming the age we live in.

A celebrated Englishman said long ago that it required a surgical operation to be performed upon a Scotchman before he could understand a joke. I think Sydney Smith was, even then, too hard upon North Britain; but be that as it may, I have no hesitation in saying that we can now both understand a joke and appreciate a picture without dissecting either.

I am very glad to hear that such a splendid gallery has been secured in which to hold the exhibition, and I only hope that the array of pictures sent in will be worthy of the place.

Will the committee who are making the arrangements allow me to suggest that they take a leaf out of the London Society's book, and rigidly exclude coloured work? Reasons are not far to seek why a rule to this effect should constitute a part of the regulations. There is, first, the fact that plain photographs are killed by coloured pictures being near them; second, coloured pictures are rarely executed by the photographer himself, and therefore do not represent his own work; and, lastly, to hang coloured photographs on the walls of a gallery where year by year the grandest efforts of our Scotch portrait painters are exhibited, would only cause a sneer to curl the lips of the artists, who will, doubtless, visit the rooms on that occasion.—I am, &c., B.

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[*] Ovid's lines, to which Dr. Diamond felicitously refers, are worth recalling to the students of a liberal art.—Ed.

"—— Ingenuas didicisse fideliter artes
Emollit mores, nec sinit esse feros."

Anglice.

"Ingenuous arts, where they an entrance find,
Soften the manners and subdue the mind."

THE PATENT IN SENSITIVE GELATINO PELLICLE.

Sir,—The two letters appearing in your issue of last week render it desirable for me to make a few remarks. Will you kindly reprint the letter which appeared six days before the date of Mr. Kennett's patent. It is as follows: "I hope the following hints to gelatino-bromide workers will be found useful. To make the gelatino-bromide emulsion, put half the gelatine to be used into one vessel, and the other half into another. Now pour as much bromide of cadmium solution into one of the vessels, and as much nitrate of silver solution (measured) into the other, as will cover the gelatine. The strength of solution will depend on the quantity of silver bromide required in the gelatine. When the gelatine is swelled sufficiently, pour the solution off and measure; by that means the quantity of bromide and silver taken up by the gelatine will be ascertained. Keep the bromide in excess of its equivalent of silver, by adding bromide solutions if required. Heat both the quantities of gelatine until dissolved, then mix, stirring with a glass rod. Let it stand till cold, cut in slices with a piece of thin glass, and wash in distilled water to remove the excess of bromide."

In Mr. Kennett's patent he claims "a substance or compound for forming photographic emulsion, which, when prepared in a dry or solid condition, as herein set forth, will remain perfectly good and fit for use for any required time."

The above letter shows he has no claim whatever to the "substance or compound," it having been previously published.

As to drying it—What is Nelson's gelatine, and all other forms of dry gelatine? Simply gelatine dried by the process attempted to be patented by Mr. Kennett, and thus formed into a pellicle. Now Mr. Kennett has no claim whatever to the previously published processes of Dr. Maddox, Mr. Johnston, and others; he has none to the drying of gelatine (which is already done as described by Mr. Kennett) by the gelatine manufacturers; and yet he attempts to seal up a good process from the photographic public. And in the interest of the said public, one might ask, what has Mr. Kennett ever done for them? Has he ever published anything? Has he even ever given the public a hint of any value? I do not think that under the circumstances the president did more than his duty in protecting a member of the society, who was giving information *pro bono publico*, from an attempt to muzzle him for the commercial benefit of one individual.

I am no foe to patents; I work as a licensee under the Autotype-Lambertype patents, and am glad to do so. I object to noone making money by their inventions, but it must be *their* inventions, and not other people's.

In conclusion, let me point out how we form a gelatino-bromide pellicle. We take Nelson's gelatine (already a gelatine pellicle), and having dissolved it, add silver bromide to it. We then restore it to the state of pellicle by the process published by Mr. Johnston, drying by the same process originally used by Nelson and Co., to make the plain gelatine pellicle, and thus restoring it to the state of Nelson's gelatine pellicle, plus silver bromide.

That Mr. Kennett, having had no hand in inventing any part of this process, should attempt to interfere in this performance with a patent, is simply an absurdity.—Yours, H. Stuart Wortley.

Sir,—Allow me to point out a serious fallacy into which your correspondent "Photo-Chemist" in the News, and Col. Stuart Wortley at the photographic meeting, appear to have fallen. They seem to assume that because some one made a gelatine emulsion, and that a pellicle might by chance or intention follow, that Mr. Kennett can have no claim to patent a pellicle which he actually did make. They assume that because an emulsion is necessary to make a pellicle, an emulsion and a pellicle are the same thing—which is about as logical as saying that, because an oak may grow from an acorn, that an oak and an acorn are identical.

So far as it appears from the discussion, no one either made a sensitive gelatine pellicle, or thought of such a thing, until Mr. Kennett patented it; and, as you have often urged in these columns, the absolute production of a new thing, no matter how many known things are combined in its production, constitutes the legitimacy of a patent claim.

With all respect for the combatants on both sides, I have not (as a wet plate worker) felt sufficient interest in the question to search further than the recent discussion for facts and authorities; but I agree heartily with your correspondent "Q." that, if Col. Wortley were allowed to attack or dispute Mr. Kennett's claims, the latter gentleman had a legitimate right to an answer, and that he was not treated well in being snubbed for attempting to defend his patent from the attack.

I have no sympathy with that superfine affectation of purely scientific interests which prevails in the parent society; and believe, with your correspondent, that a manly, moderate, and courteous consideration of anything affecting the commercial or professional aspects of photography which might arise, would do much to restore the nearly moribund society, and give it the vitality which belongs to really human interests. I believe the council means well, but they are working on wrong lines.—Yours truly,

Fair Play.

Proceedings of Societies.

Edinburgh Photographic Society.

A special general meeting of the Society was held in the Bible Society's Rooms on Wednesday, the 21st inst., Dr. Thomson, the President, in the chair. Messrs. John Lamb and W. S. Muir were admitted ordinary members.

The object of the meeting was to receive a report from the council as to the proposed arrangments for the forthcoming exhibition. The council congratulated the Society on having obtained the loan of the National Galleries in which to hold the exhibition, and reported that the arrangements were well advanced. The proposed nature of the exhibition will be readily understood from the following circular, which was appended to the report, and which it is intended to circulate both at home and abroad.

The Council of the Edinburgh Photographic Society desire to intimate that they intend to hold an exhibition of photographs, photographic apparatus, and material, in the Royal Scottish Academy National Galleries, the loan of which has been liberally granted for that purpose by the Lords of Her Majesty's Treasury, to be opened on Friday, December 15, and to continue open until about the middle of January, 1877. In addition to the ordinary character of exhibits, it is intended to illustrate historically and technically the processes connected with the art through their various stages, and the Council will regard it as a special favour if those having unique specimens, especially of the earlier processes, will kindly lend them for exhibition. A series of medals will be awarded for the best pictures, &c., as undernoted; but exhibitors resident in Edinburgh, or who are members of the Society, shall not be entitled to compete.

Conditions of Exhibition.

Pictures intended for exhibition, with the exceptions hereinafter mentioned, must be framed, and have written on the back the name of the photographer, title, process by which produced, price (if for sale), and such other information as may be necessary for the preparation of the catalogue, including the class in which they are to be entered for competition; and delivered, carriage paid, at the galleries, addressed, "The Edinburgh Photographic Society, Royal Scottish Academy National Galleries, Edinburgh," not earlier than November 20th, and not later than December 1st, both inclusive.

Pictures from America, India, the Colonies, and the Continent may be sent by post, unmounted; and the council will undertake to get them mounted at the cost of the exhibitors, the expense to be defrayed from the proceeds of the sale of such pictures, in such way as they may determine; and it is to be distinctly understood that unmounted pictures must be delivered not later than November 15th.

In all cases, each picture or case of pictures must be accompanied by a letter addressed to the Exhibition Secretary, and containing a duplicate of the information on the back of the picture, and anything else that the exhibitor may think necessary.

The council undertake to unpack, repack, and return all exhibits remaining unsold, but the return carriage must be paid by the exhibitor; and while they will take all due care of the property entrusted to them, they will not be responsible for any loss or damage that may occur.

Arrangements will be made for the sale of pictures exhibited and for duplicates thereof, for which the usual commission of 10 per cent. will be charged.

One room will be set apart for the exhibition of coloured or painted photographs, but such pictures shall not be eligible for competition.

The following medals will be awarded for the best and second best pictures in the several classes, to be decided according to the opinion of five gentlemen of eminence as artists or photographers, a majority of whom shall be chosen outside the Society; and special judges shall be appointed to decide on the awards for apparatus and material.

1. A Gold Medal for the picture which, in the opinion of the judges, possesses the highest degree of merit, irrespective of size or subject.
2. One Silver and one Bronze Medal for the best and second best landscape of 8½ by 6½ or under.
3. One Silver and one Bronze Medal for the best and second best landscape above 8½ by 6½.
4. One Silver and one Bronze Medal for the best and second best portrait from 8½ by 6½ to 15 by 12.
5. One Silver and one Bronze Medal for the best and second best portrait above 15 by 12.
6. One Silver and one Bronze Medal for the best and second best landscape, being the work of an amateur.
7. One Silver and one Bronze Medal for the best and second best genre picture.
8. One Silver and one Bronze Medal for the best and second best combination picture.
9. One Silver and one Bronze Medal for the best and second best single figure study.
10. One Silver and one Bronze Medal for the best and second best reproduction from painting in oil or water colour.
11. One Silver and one Bronze Medal for the best and second best enlargement of any subject, and by any process, provided it be the work of the exhibitor, or done in his premises.
12. One Silver and one Bronze Medal for the best and second best photo-mechanical print.
13. One Silver and one Bronze Medal for the best and second best enamel.
14. Three Silver and three Bronze Medals, to be awarded according to the discretion of the judges, for improved apparatus, materials, processes, &c.

Competitors, with exception of those for the single figure study, must exhibit not less than three pictures.

Pictures may be sent for exhibition only, and not for competition, but such reservation must be marked on the back of each, and will be noticed in the catalogue.

All communications must be addressed to Dr. John Nicol, exhibition secretary, 16, Warriston Crescent, Edinburgh.

Considerable discussion took place on that part of the report referring to medals, but it was ultimately resolved to adopt the recommendation of the council, subject to the condition that *exhibitors resident in Edinburgh, or who are members of the Society, shall not be entitled to compete.*

Talk in the Studio.

Photography at the Scientific Loan Exhibition.—On Tuesday next, at the Scientific Exhibition, we find, in the programme of conferences, that Mr. J. R. Sawyer will lecture on the Autotype Company's printing processes. On Monday, also, explanations will be given of Dallmeyer's photographic lenses.

Surprising Films.—In noting a recent mission of one of our valued collaborateurs, Mr. Baden Pritchard, the *Times* makes some curious blunders. It says that he "has perfected, as a result of a mission to Paris for the purpose, a practical system of micro-photography for maps in war time. His principle is to reduce the maps to a moderate size in order that they may be sufficiently magnified by a small instrument easily carried in an officer's pocket. The maps are photographed on sheets of white *glycerine*. The *glycerine* is tanned with alum, and further prepared by being *washed* with collodion and castor oil. The maximum size of a map is six square inches, and fifty or sixty charts will go into the depth of half an inch. Officers are to be provided with an instrument having a collapsible dark chamber, into which when in use the photographs can be slid. They will then be examined like transparent stereoscopic slides. The immediate adoption of this arrangement for the army is contemplated." The italics are, of course, ours. For glycerine *gelatine* is clearly meant, and for "washed" *treated* should probably be used. The size of the maps should also be two inches instead of six inches.

A Dry Plate Fifteen Years Old.—The following letter from Mr. Brook, describing a negative produced from a plate fifteen years old, was read at the last meeting of the Photographic Society:—"This plate (one of a few left) was prepared by Dr. Hill Norris some short time previously to Feb. 5th, 1861, as I found a note from Dr. Hill Norris, which accompanied the plates when he sent them to me, bearing the date of Feb. 5th, 1861. They are part of a dozen small plates I then had from him. I used some of them; but, being obliged by other business to lay aside photographic work, I packed the remainder pretty carefully, intending to use them probably after a few months' time. But I never again resumed my photographic work, and the plates have ever since the spring of 1861 remained where I found them a few days ago. They have lain for these fifteen years in a small deal box in a drawer in which were a number of old photo-chemicals (*inter alia* hyposulphite of soda) in a bottle. I found the plates packed in pairs between yellow papers. No doubt there had been a covering of thin gutta-percha tissue; but this had evidently long ago crumbled away to dust, as I found only a quantity of small flakes of the material, looking most like crushed shellac flakes; the packet was covered with lead foil. I think this covering may possibly have most contributed to their long retention of sensibility. The lead foil seemed, when opened out, to be somewhat coated with grey oxide. To the best of my belief and recollection of the exposure I had to give fifteen years ago, I should say that these plates are now only about one-fourth as sensitive as they originally were; the collodion film seemed very hard and horny, but not at all disposed either to crack or float off; in fact, notwithstanding long development, the film bore roughish use in the washing, without the least disposition to separate from the glass. After exposing for about 25 minutes (a dark subject and not a good light), and having washed the back but not the collodion side, I put the plate into a bath of 2 grs. pyrogallic acid (very old and brown), ½ gr. citric acid, to 1 oz. distilled water, supposing the film would take a long time to be penetrated by the fluid. I left the plate in this bath for nearly an hour; the developer had not decomposed; there was no trace of any image. I then made another bath of the same solution of pyrogallic acid, adding to each ounce 2 drs. of a 5-gr. solution of nitrate of silver. The picture then began to appear slowly; and when a weak but clean and well-defined negative had gradually developed itself, I found the image ceased to become more dense. I thought I would try a fresh bath, with double the dose of silver solution. Immediately on placing the plate in the fresh developer it seemed disposed to fog; and so, fearing to lose my negative altogether, I decided to be content with what I had got, washed well, and fixed with 1 oz. hyposulphite to 4 oz. water. A print from this negative I now submit for inspection.

I have three or four of these fifteen-year old small plates still left; two of them I intend to keep till they are twenty years old."

The "Jowly" Portrait.—*Funny Folks* makes merry at the expense of the defendant in the case, reported in our last, tried in the Exchequer Division of the High Court of Justice. It says:—"The gentleman who recently objected to pay a well-known firm of photographers for his wife's portrait, on account of its being 'jowly,' has had to pay £37 and costs, he being at liberty, of course, to retain the picture. No doubt he feels very much annoyed. But what will he do with it? Will he hang it up in his dining-room in order that its 'jowliness' may be always before him? I can fancy him singing a merry song, with a chorus, as follows:—

'It's jowly in the morning,
It's jowly in the evening,
It's jowly in the afternoon,
It's jowly all the day!'

If it were the portrait of a man, it might be a capital provocative to his friends to sing:—

'For he's a jowly good fellow
Which nobody can deny!"

In addition to this, appears in the same paper a rather long poetical effusion on the same subject, entitled 'The Portrait.'"

Liquid Parchment.—According to Dr. Hofmann, a fluid by this name, consisting of gutta-percha softened and soaked in ether, is especially adapted for forming a coating for pictures and cards, as it permits the removal of dirt with a moist rag. Pencil and crayon may be rendered ineffaceable by sprinkling them with this liquid by means of an atomiser, an exceedingly delicate film remaining after the evaporation of the ether.—*English Mechanic.*

Coating Brass and Copper with Zinc.—It is not often that it is necessary to coat either brass or copper with zinc, the ordinary "silvering" (*i.e.*, washing with tin) answering most effectually under all ordinary circumstances. Still, a method of coating them with zinc may be found useful. The usual process of boiling the brass or copper articles in a concentrated solution of chloride of ammonium containing shavings of zinc is, then, superseded by a method discovered, we believe, by Bottger, in which an alkaline solution of oxide of zinc is found to give a better result in less time. An excess of powdered zinc is placed in a boiling solution of potash or caustic soda. The brass or copper articles after cleaning are then immersed in the solution, and after a minute's immersion they may be withdrawn covered with a coat of zinc. By this process an easy method of converting copper plates into pinchbeck is furnished to the mechanic. The copper plates thinly coated with zinc are heated, preferably in an oil bath, to from 250° to not exceeding 285° Fahr., when the coating of zinc will be found to combine with the copper, forming an excellent pinchbeck, more or less of a golden colour. When the desired hue is attained, the plates must be immediately cooled in water or any other suitable liquid. The process is also employed for making Zamboni's piles (dry voltaic piles). Very thin pieces of sheet copper are coated with zinc, and the latter is subsequently removed from one side of the copper by means of hydrochloric acid. Piles made from discs of the metals thus prepared are said to give much better results (are more active electromotors) than layers of gold leaf or the other materials used in constructing Zamboni piles.

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To Correspondents.

Beta.—The stain in your print has been caused by hyposulphite of soda coming into contact with the print before it was fixed, most probably from the use of an unclean dish in rinsing before the print was toned and fixed. Such stains often arise from the promiscuous use of the same dishes for various purposes. A dish which has been used to rinse or wash prints after fixing should never be used for holding toning solutions, or for rinsing prints before fixing, as minute traces of hypo are apt to cling about a dish after it is washed, and these are capable of doing much mischief. A similar stain would be produced if the print came into contact with traces of silver whilst it still contained hypo. The print itself contains many good qualities.

C. C. Cox.—The chief cause of matt silver stains is the use of a horny repellent collodion—that is, a collodion which gives a horny repellent film. One of the best collodions in commerce is sadly liable to this defect when new; but it gradually gets rid of this tendency as it ripens. Probably the best remedy is the addition of a few drops of water to each ounce of collodion. The addition of a portion of old ripe collodion is a good thing. Immersing the plate before it is very thoroughly set is a good thing, and allowing as short a time as possible to elapse between removing the plate from the silver bath and developing it. 2. No; we prefer pure crystallized nitrate of silver.

Enquirer.—The red fog you describe, arising during intensification after fixing, is not uncommon. The remedy is the application of a solution of iodine before intensification. Take iodine 1 grain, and iodide of potassium 2 grains, and dissolve in an ounce of water. Apply this to the negative to be intensified for about a minute; then wash, and proceed to intensify. When the fog has occurred, the best remedy is the application of a weak solution of bichloride of mercury, which turns the red fog white, and makes it scarcely show in printing.

S. Y. B.—A cover of thin mackintosh cloth answers very well for a dark tent. Failing this, three thicknesses of calico will serve. The inner, or lining surface, should be of yellow glazed calico, and the other two of black twilled calico. These will exclude light, but are not, of course, waterproof. On the whole, mackintosh waterproof cloth is best; its chief drawback is being air-proof as well as waterproof, and therefore hot. We cannot tell you the exact preparation of the caoutchouc used; but we think there is no danger of it sticking in the sun. We prefer Jones.

J. A. C.—We believe that Mr. Payne, photographer, Aylesbury, will supply some. 2. The best plan is to coat the negative film with melted gelatine, and when that is dry with leather collodion, and finally remove from the glass.

Constant Subscriber.—We do not know the name of a firm supplying india-rubber rollers. Possibly the Autotype Company may do so. Leather lithographic rollers may be used; but they do not answer so well.

D. S.—We see no reason to conclude from your description that the hyposulphite is impure. The chief impurity present, as a rule, in hyposulphite of soda is sulphate of soda, the only effect of which would be to make it a little less active as a fixing agent; hence the prints would be reduced less when this impurity was present than when it was absent.

Light.—Coffee plates may be developed either by the alkaline method or by acid pyro. We are uncertain which was employed by our correspondent, but will ascertain. The exposure is probably about three times as long as that of wet plates; but is best ascertained by trial.

T. C.—We fear that we cannot help you to a remedy for the stain, which is doubtless caused by the ammonia, which has probably acted by removing the dye from the cloth, or changing its character. Not knowing the dye in question, we have no basis for a suggestion. The bromide, &c., would probably not stain.

F. Williams.—The best guide to carbon printing is the Manual of the Autotype Company.

E. W.—Your question is rather a legal one than a photographic one. So far as we understand the matter, it is illegal to use a still at all, or for any purpose, without permission of the Inland Revenue authorities; but we believe that permission can be obtained without payment on satisfying the authorities that it is only used for distilling water for use in photography.

J. H. W.—The view of the Chateau of Chillon from the other side is just as perfect as the first, and is very charming indeed. Unfortunately, the copy sent was considerably injured by bending and breaking in the post. Both the Chillon views and the early morning effect would make very charming transparent effects. All the portraits are excellent. The open-air effects are most perfect. Will you please state the mode of development you use with coffee plates, and also state the exposure you give as compared with wet plates? A correspondent asks us.

J. Buckley.—We shall be happy to hear further details of your plate holder. 2. As a rule, we do not give the addresses of our correspondents, as we feel bound to protect them from the mass of correspondence in which a communication in our pages might involve them. Any further hints can be given through our pages; but it is not fair to trouble those who publish their experience with private correspondence thereon.

Received:—"Woman: Her Mission and Education." By Emme Dee.

Several correspondents in our next.

The Photographic News, July 7, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Photographer and the Wood Engraver.—A Good Magnifying Glass.

The Photographer and the Wood Engraver.—It has often struck photographers given to experiment—and there are very few of us who have not essayed to carry out some idea or other that has occurred to our mind—that we ought to be able to do with an artist's sketch what the wood engraver contrives to effect. The artist probably makes a charge of ten or twelve guineas for a drawing upon wood, and the cost of engraving it frequently comes to as much more, so that if photographers could suggest a manner of dispensing with the graver, the publishers' expenses would obviously be reduced by nearly a half. Everybody knows that now-a-days there are several photo-type processes, methods by means of which a photograph in relief upon a metal plate is produced, such as may be printed in an ordinary printing-press. The Dallastype is a very perfect phototype process, as the minute reproductions of newspapers produced by it fully demonstrate; and other methods have been worked out on the Continent with nearly the same success. Any book illustrations can be copied in this way, and the blocks produced again printed in the ordinary type press; the same results being also obtainable by surface printing. If we can do this, why, then cannot we take an artist's drawing, and produce a photo-type of it, which could be printed in the printing-press? If, say, many photographers' artists would only use jet black pencils, or would sketch in pen and ink, there would be no difficulty in the matter; but some of their lines are lighter than others, and herein lies the difficulty. When once the sketch is printed on paper, the photographer can obtain a photo-type of it; thus, if Mr. Pennell or Mr. John Proctor would only draw their sketches as we see them in *Punch* and *Funny Folks*, we should be able to help the publishers of these periodicals to dispense with the costly and tedious wood engraving. Fortunately for the wood engraver, however, his time has not yet come, nor is it very probable that his cunning hand will be out of work for some time yet. The reason is simply this. There are two classes of wood engravers, the one who does *fac simile* work, and he who cuts sketches that have been produced by washes, and not lines. Good engravers are artists, but he who produces a cut block from a picture in tints must be a very good one indeed, and approaches most nearly the engraver on copper or steel, who has to reproduce a painting in many colours in black and white. Engravers of the latter class, of whom Mr. Palmer, of the *Illustrated London News*, is one of the best representatives, have to transform into line work the washed or mezzotint picture supplied by the artist, and it requires some genius, as well as skill, to do this well. He has to interpret the artist. If the sketch were in monochrome, this might be done by Woodburytype, but then no type-block would be produced such as an ordinary printer could employ. Obviously, therefore, the photographer cannot, as yet, take the place of this class of engraver, if ever he will be able to do so; and it is the same pretty well with the *facsimile* engravers. Such gentlemen as Mr. Swain, of *Punch*, and Mr. Hollige, of *Funny Folks*, do far more than allow lines indicated by the artist to stand in relief, which is all the photographer could ever hope to do. The black lines made with the point of the pencil the camera could render very well, but not so those where the artist has worked rather with the side of the pencil and has produced a broad grey line. This, if it were rendered at all in the negative, would be as black as the fine line, a result utterly at variance with the artistic idea. The engraver works solely to give the intention of the artist, and, consequently, instead of having a broad line, which would print black in the printing-press, he splits the line, and leaves a white space running up the centre of it. Again, sometimes the pencil crumbles and fails in parts, but here, as before, the engraver knows the intention of the artist, and works as if the drawing were complete. It is needless to say that in this case the photographer would be again at fault, for he would produce such unintentional defects as well as all the beauties of the sketch. Often, too, the artist indicates a texture which he does not trouble himself to complete, but the graver, who has particular ways of interpreting drapery, grass, foliage, &c., fills in the picture to the best of his ability. These are some of the reasons why photographers fail in their endeavours to replace the engraver, and why the doom of the latter will not be so easily sealed as many suppose. Many experimenters have worked hard at the subject without being aware of the difficulties in their path, only having regard for the mechanical problems to be solved, and not knowing of the artistic crotchets that have also to be considered. We have no wish to damp the ardour of any investigator upon this particular path, and only make these remarks to point out the main difficulties that stand in the way of a satisfactory solution of the problem.

A Good Magnifying Glass.—A really good magnifying glass is always useful to the photographer, while to any one who busies himself with reproductions of fine engravings, or with the multiplication of maps or plans by photo-lithography, such an instrument is simply a necessity. At times, indeed, the ground glass is far too coarse to focus upon in the case of very fine lines, and here a deposit of silver upon a glass plate has to be resorted to, unless the photographer can manage by moving the screen up and down while he focuses, a very good plan of getting rid of the grain. Again, in retouching small negatives or positives, to be enlarged, a good magnifier is essential, and for such purposes the so-called plotyscopic lens answers exceedingly well. Its great advantage is that it has a very flat field, and hence we have more than just a central point in focus, as in the case of ordinary glasses. The lens, we believe, can be procured from any optician, although the one we have used was produced by Browning, of the Strand.

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FRENCH CORRESPONDENCE.

M. Janssen's Atelier—Photography in Colours—Photo-phenakistiscope—The Radiometer.

I had the good fortune this week to visit the observatory of physical astronomy which has been provisionally constructed by M. Janssen, and in which he obtained the beautiful pictures of the sun of which I spoke in my last letter. It is one of the most curious photographic ateliers in existence.

M. Janssen has chosen at the end of the Boulevart Ornano (a new thoroughfare which passes from south to north at the front of the Butte Montmatre), a site which has remained isolated from buildings, and here he has established himself with all the appurtenances which he took with him to Japan to observe the Transit of Venus. Indeed, he has simply transplanted this observatory, which stood him in such good stead at Nagasaki, to the north of Paris. A tent and a circular building of wood covered in in such a manner with shutters that any portion may be opened at will to make astronomical observations, form the principal part of the encampment. Each is furnished with a powerful telescope and instruments necessary for astronomical research.

Besides these erections is a laboratory and a study, and finally a larger building is the photographic atelier, &c.

The two apparatus employed by the worthy physicist to secure his daily pictures of the sun are telescopes with cameras fitted to them. The instruments work with mathematical precision, following the path of the sun, but the chemical focus having been determined beforehand, the instrument is always ready for use. One of the telescopes is of larger diameter than the other; the first gives images of twenty-two centimetres, while those furnished by the other measure but twelve.

The amplification of the photographs is done in the interior of the telescope by the aid of an optical combination placed in the normal focus of the instrument.

M. Janssen works with wet or dry collodion indifferently, but always takes care to coat the plates first of all with albumen to give the film more adherence. The exposure never exceeds one-fiftieth of a second, and to arrive at this rapidity M. Janssen has constructed a cap for his lens which is a *chef d'œuvre* of ingenuity and precision. Speaking briefly, it is a metal plate furnished with a slit, the plate sliding upon another with a larger opening; but so that in this short time the action of the light shall be equalised during the whole of its passage, a mechanical arrangement has been devised to maintain all the conditions of equilibrium. This instrument alone represents a vast amount of study and scientific knowledge.

The images obtained are marvellously sharp and clear, and, thanks to their dimensions, the most minute details are to be distinguished upon the solar disc. M. Janssen was good enough to allow me to inspect the whole series of them, and, on examining them in succession, it was easy to observe all the differences which exist between them, and which constitute them of such value for scientific purposes.

As I have already pointed out, these valuable clichés are destined to be printed upon paper to be sent to the different observatories of the Republic; but to preserve them, and thus to constitute valuable solar archives for the use of future astronomers, M. Janssen has had recourse to printing in permanent pigments. He has printed all his negatives by the carbon process, only there is much to be desired in the fineness of the pigment employed in the tissue, for astronomical pictures are unusually delicate. It will be necessary to modify the process before it can be satisfactorily employed in photo-astronomy, and M. Janssen himself is about to study the subject; any improvement that he may effect will be gladly seized by photographers.

I may add that M. Janssen is ably supported in his daily work by M. Arents, the same practised operator who accompanied him to Japan, and who directs all the photographic operations.

At the last meeting of the Academy of Sciences, M. Victor Cros demanded the opening of a sealed envelope which he deposited in 1867, and which contained matter connected with photographic applications, and notably the production of pictures in natural colours. Acting upon his wish the perpetual secretary, M. Bertrand, broke the seal and made public the contents.

The author proposes first of all to take instantaneous and succesive pictures of persons or objects in movement, and to attach them to a revolving disk, so that on examining them through a slit they will produce the well known effects of phenakistiscope, the object being seen as if it were in motion. In 1867 this idea was not new, for our regretted friend Claudet had already realised it. As to photography in colours, the note communicated to the Academy gives no details upon the subject. At the same time the author has shown me two or three coloured images, which have the same appearance as those of M. Ducos du Hauron. From their appearance I should think they were obtained by the aid of three impressions, in red, blue, and yellow, which have been superposed. The author, to whom we communicated our idea, remarked that the process did in fact much resemble that of Ducos du Hauron, but that he enjoyed the priority of discovery. This is a moot point, and one which I shall not decide, as the process is far from perfect, and requires considerable improvement.

The radiometer is beginning to attract the attention of scientific men here. At the meeting of which I have just spoken, M. Govi, corresponding member of the Academy, submitted some remarks relative to experiments undertaken to make application of the instrument. M. Govi thinks that even in a vacuum there remained upon the surface of the sails of the apparatus, as is the case with everybody, a certain quantity of gas which, under the influence of heat, becomes dilated, and thus causes the movement of the sails, which it pushes as it quits them. It is the black of the sails which is the seat of the phenomenon, because it absorbs more heat. In reply to this theory of M. Govi, M. Fizeau cited an experiment which contradicted it absolutely. If a circle of lighted candles is placed around a radiometer, the wings of the apparatus are equally lighted and heated upon both faces; yet a movement of the radiometer is produced under these circumstances. The velocity was measured in periods of five minutes, and was found to be quite constant. It can hardly be said, therefore, that the movement is due to any dilation of gas, as in that case there would be a slackening of speed after a time. In a word, we have still to find out the true explanation of the radiometer.

Ernest Lacan.

THE RETOUCHING OF PORTRAITS.*

In no case should the negative be covered with a varnish applied cold, that dries up with a matt surface. This manner of operating is bad; the cliché generally becomes covered with spots, and there is produced a grain, more or less apparent.

I recommend the use of a varnish of the following composition for negatives, as it permits retouching upon with considerable ease:—

Solution No. 1.

Absolute alcohol	80 cub. cents.
Pulverized sandrac ...	15 grammes
Turpentine	5 cub. cents.
Essential oil of lavender ...	4 ,,

Solution No. 2.

Absolute alcohol	22 cub. cents.
Ether	2 ,,
Bruised camphor... ...	5 grammes
Distilled water	10 cub. cents.

The two solutions are mixed, allowed to rest for some days, and then filtered through paper; the varnish is then ready for use.

The solution of the sandrac is more easily brought about in absolute alcohol.

The addition of water to the alcohol in the second solution is for the purpose of thinning the varnish, so that it will not render the transparent shadows of the negative opaque.

The longer the varnish remains upon the negative the harder it becomes, and the harder, therefore, must be the pencil employed upon it. In the same way a soft pencil should be employed upon a soft film.

A dry and even film of varnish does not always take the pencil equally in all places, and it is for this reason necessary to rub some parts of the surface with finely powdered pumice, or with sulphate of baryta.

The film of varnish should not be too thick; it should be strong and resistant enough to support the action of a finely pointed pencil, or the action of a powder rubbed upon it.

The defects in a negative are made good, either by stippling with pigment of the same colour as the film, or by hatching with lines almost touching one another. The tint may be augmented by crossing the lines in such a way that the lines or points present a uniform surface to the eye, without interstices; otherwise, when printed, those portions which have been retouched show a mass of white points or lines, not in harmony with the rest of the surface. The points or lines may be corrected at any time by using a piece of rubber cut to a point.

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* From *Retouche Photographique, par un Specialiste.*

Wherever the point of the pencil touches it should leave its mark. It is possible, indeed, after a little practice, to draw the pencil point along so as to make it bite; this, however, is only the result of practice, for if at first you may meet with some difficulty in getting the pencil to attach itself, after a few months nothing appears so easy as to retouch, even upon a brilliant surface. The defects of the portrait are retouched, such as the freckles and other parts that have been rendered too transparent, by means of the pencil in such a way that those spots shall not be distinguishable from the surrounding parts. It is also necessary to work upon the deepest shadows, to soften the more pronounced folds, and, in a word, render the negative as harmonious as possible.

Excellent results may also be obtained by varnishing the reverse side of the negative. The portions to be retouched are gently rubbed with powdered pumice, and a little of this powder is rubbed with some graphite. This mixture is then applied by the aid of a stump or tuft of cotton wool to the transparent parts of the cliché. The results thus secured are quite marvellous, and are obtained with the greatest facility. But the pencil alone is not always sufficient, especially in the very transparent portions of a negative treated with pyrogallic acid, the grey tone of the graphite not being opaque enough beside the dark silver film of the image.

For this reason two means are necessary for the satisfactory treatment of a negative, notwithstanding the fact that many photographers only employ one. I employ both the pencil and the brush. Indian ink diluted with gum-arabic is the mixture that I apply with the brush. It is good also to add to this colour a few drops of glycerine, as it works more easily and becomes more solid. By adding more or less gum you may augment or diminish the depth of the tint. Only it is absolutely necessary to allow the film of colours to dry every time before treating the place a second time, and to take up but a little colour in the brush. With this same colour, added to gum, you may also paint of an equal tone large portions of the negative which appear too transparent, such as the hands, the arms, the hair, the beard, &c., which sometimes come up too black in the positive. With a brush rather larger than usual it is possible to cover these portions very evenly without tampering with the half-tone. The work requires a little skill, but after a few trials a very uniform surface will be secured. As soon as the colour is dry, any of the pigment which has overlapped the outlines is removed with a small damp brush.

If any patches or portions of the negative should remain with too much colour, they are equalized afterwards by the aid of the brush or the pencil. When working upon the reverse side of the negative to impart more harmony and clearness to the prints, Indian ink should be used alone without any addition of gum. The colour is applied by the brush, and immediately afterwards the surface is touched lightly with the tip of the finger, until a grain is produced by the markings of the skin. The same results may be produced by the aid of a short-haired brush, which is employed to break up the colour. If the intensity of the film is not satisfactory, a darker tint may be secured with a soft pencil carefully pointed, executing a series of hatchings upon the surface of the colour obtained.

Very often photographers employ vegetable red and blue, Prussian blue, burnt sienna, gamboge, &c., for covering large portions of a negative, these colours being transparent, and capable of a uniform application. As a rule, in order to prevent as much as possible the grain of the retouching from being perceptible, it is well to work as long as possible on the negative film itself, taking care to keep it as clean as possible the while. Then, when it will take up no more colour or blacklead, you work upon the back of the negative.

Spots, pinholes, or other defects in the negative are covered with Indian ink or with carmine, taking care not to moisten the point of the pencil with saliva, for then the colour becomes bad, and does not cover.

To retouch negatives which are to serve for printing a vast number of copies, I recommend also the following means: Take some ordinary yellow amber varnish which dries very slowly, and add to it a little oil of turpentine; filter, and pour it upon the negative either warm or cold. The film is allowed to dry, carefully sheltered from the dust. The next day, or after sufficient time has elapsed, this film is worked upon with pencil and brush.

As soon as the retouching is finished, the negative is treated with ordinary varnish, warmed to a moderate heat. This second coat of varnish completely protects the retouching, and you may at any time dust the film without risk, or even free it from dirt with a wet sponge. The second film of varnish is, indeed, rendered more solid by the tenacity of the under film of yellow amber varnish.

A LECTURE ON LENSES.

BY JOSEPH ZENTMAYER.*

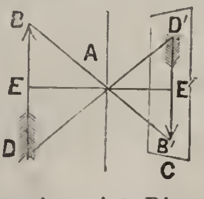
Some months ago, being annoyed by a severe toothache, I went to a respected friend, a dentist. He examined my teeth, and said, "We will have to extract some of them." Seeing my nervousness, the doctor said, "It won't hurt you much; I will give you no more pain than necessary; I will treat you gently, if you please sit still." He pulled out three teeth *very* gently! I will not say that to hear a lecture on lenses is as bad as getting a tooth pulled; but I will say what the doctor said, "It won't hurt you much; I will not give you any more pain than necessary; I will treat you gently; and please sit still as long as you can bear it."

A lecture on lenses is a difficult one to make entertaining. It is especially so to me, as I am labouring under two disadvantages, the first of which, as you may have already noticed, is that I am not speaking in my mother tongue; and the second is, that I have never spoken before so large an audience. For over thirty years the shop has been my domain. I hope you will make allowance for it.

Most of us recollect the splendidly illustrated lectures on light, by Prof. Henry Morton, and the well digested lectures on light and photography by Mr. Coleman Sellers before the Franklin Institute; and it remains for me only to recal to your mind some simple properties of light relating to our subject, with which you are already familiar.

Light is propagated in a straight line. We cannot see around a corner. If a ray of direct sunlight passes through a small hole of any given shape into a darkened chamber, and we hold a screen near behind the aperture, we observe a bright image of the shape of the hole. If we increase the distance of the screen and the aperture, the image of the hole disappears in the penumbra, and the round image of the sun takes its place; and, if the hole is small enough, you will see not only the image of the sun, but the image of all the external objects will appear likewise. This is one of the most interesting experiments, and its explanation is easy. Each point of the object B D (Fig. 1) radiates light in every direction, light of the same colour as it appears to our eye. From the point B no light can reach the screen C, except through the small aperture A at B′; but if the aperture is infinitely small, no other point of the object can send its rays to B′. The same is true for every other point, for E or D, for instance; these can only send rays to their respective points D′ and

Fig. 1.



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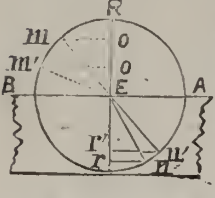
* Journal of the Franklin Institute.

E', and so on with the rest, and an inverted image, with all the natural colours of the object, is produced on the screen. If we now enlarge the hole, different points of the object would reach the same place upon the screen; the images of these points would overlap each other, and the image of the object would be indistinct. If the aperture is sufficiently enlarged the image disappears, and the screen is illuminated homogeneously, taking only a tint of the most prominent colours of the objects. Therefore the smaller the hole is the sharper but fainter is the image. The size of the image depends upon the distance of the object from the hole, and also upon the distance of the screen from the hole. This primitive camera-obscura is known by the name of pinhole camera.

Light, we said, is propagated in a straight line; but this is only true when it continues in a medium of the same density, or if it enters a medium perpendicular or normal. But if a ray passes from one medium into another of different density obliquely, its direction is changed—it is refracted. This property of light was known to the ancients about eighteen hundred years ago, but the discovery of the law of refraction was left to Willebrod Snell, Professor of the University of Leyden, 1621. I will briefly state this very important discovery, which elevated optics to a positive science. If a ray of light, R (Fig 2), falls perpendicularly upon a plane surface of a piece of glass, A B, it enters the glass without changing its course, in a straight line, R D, it only changes its velocity. But if a ray, m, strikes the surface at E, obliquely, it is refracted to n. A ray, m', is refracted to n'. Now if we erect perpendiculars from the points m and n, and also from the points m' and n', to the normal R D, and divide the length $o\,m$ by $n\ p$, and also divide $o'\ m'$ by $n'\ p'$, we will have in both cases the same quotient, or, as it is generally expressed, the sine of the angle of incidence divided by the sine of the angle of refraction is a constant, whatever the angle of incidence may be. This constant quotient is called the index of refraction. Different media have different indices of refraction; thus a diamond has a higher index of refraction than flint glass, and flint glass a higher one than crown glass.

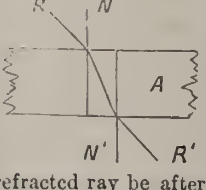
Fig. 2.



Another important law of refraction may be mentioned. It is this: The incident and refracted ray and the normal are situated in the same plane.

If a ray of light falls on a parallel piece of glass, A (Fig. 3), perpendicularly, it will pass it through in a right line, because it is coincident with the normal. But if a ray, R, strikes the glass obliquely, it will be refracted toward the normal, N, and away from it when leaving it. As the normals n and n' are parallel, so must the incident and refracted ray be after leaving the glass.

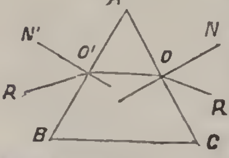
Fig. 3.



Now let us see another case, where the two surfaces are not parallel, but form an angle with each other. Such a medium is called a prism.

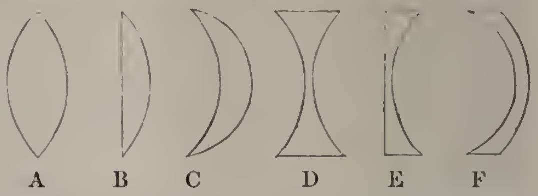
R o (Fig. 4) is an incident ray; the ray is refracted towards the normal, N, along $o\,o'$, and by leaving the prism it is again refracted, but this time from its normal, N, as it passes from a denser to a rarer medium. Therefore, incident rays on a face of a prism are always refracted towards the base. We are now tolerably well prepared to see what a lens is.

Fig. 4.



A lens is a transparent medium, of which the two surfaces are either both curved, or the one is plane and the other curved. If the curves are spherical, the lens is called a spherical lens; if the curve is parabolic it is a parabolic lens, &c. Lenses are divided into two classes, converging and diverging lenses. The converging lenses, which are thicker in the centre than at the margin, are the double convex with both surfaces convex; the plano-convex, with one surface plane and the other convex; and the convex concave (meniscus), with one convex and one concave surface, but the convex of the shortest radius. This class of lenses, which may all be used as magnifying or burning glasses, are called convex or positive glasses, and these only are, strictly speaking, lenses. The diverging lenses, which are thinner in the centre than at their margin, are the double concave, with both surfaces concave; the plano-concave, with one surface plane, the other concave; and the concave convex, with a concave and a convex surface, the concave having the shorter radius. These diverging lenses are called negative glasses. Fig. 5 exhibits the several lenses in the order we have named them, of which A B C are positive, and D E F negative glasses.

Fig. 5.



(To be continued.)

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TEMPERED GLASS.

[THE following article, which recently appeared in the *Times*, gives a very complete resumé of the facts, historical and practical, as they now stand in relation to toughened glass.—ED.]

It is now about a year since a general description of M. de la Bastie's method of toughening or tempering glass, and the special characteristics of the material produced, appeared in our columns. At that time and for some months subsequently the process was carried on at M. de la Bastie's works, at Pont d'Ain, near Lyons, upon a small scale only. Having thoroughly demonstrated that the process could be carried out, practically and commercially, with both success and profit, glass works were purchased in which the production of glass articles for domestic use had hitherto been carried on upon the ordinary principles of manufacture. These works were re-arranged to suit the new process of tempering, and some two months were consumed in experiments which were made with the view of simplifying the methods of manipulation as much as possible, and of reducing the invention to an ordinary manufacturing process. This M. de la Bastie has succeeded in doing, and the works were fairly started in February last. A careful inspection of the works, which, through the courtesy of M. de la Bastie, we were recently able to make, leads us to the conclusion that a more simple and, with ordinary care, a more certain process is not to be found in the whole circle of the industrial arts.

M. de la Bastie's works are situated at Choisy le Roi, a small town about eight miles from Paris, on the Paris and Orleans Railway. They occupy a considerable area of ground, and are arranged in various departments to suit the manufacture of toughened, or, as it is now called, "tempered" glass—"Verre trempé." There are at present two furnaces at the works, but there is ample room for extension, and it is proposed to build six more furnaces, so that ultimately there will be eight in all. This will give a large productive capacity, and will obviate the necessity for certain subsidiary arrangements, which at present obtain, and to which we shall again refer. The manufacture at Choisy comprises decanters, goblets, wine glasses without stems, plates, basins, chymical mortars, chimneys for lamps, and the like. On our visit M. de la Bastie explained the successive steps by which he had reached the present simplicity in the details of manufacture, and which necessitated successive modifications in the apparatus before perfection was attained. As, however, these facts, interesting although they are, may prove less so than a description of the process as it is now carried out in practice, we shall pass over the former to the latter, merely observing that throughout the experimental stage considerable ingenuity had to be exercised to meet difficulties which, for a time, arose at every point. Temperatures had to be adjusted according not only to the size or thickness of the article to be tempered, but also to the ingredients of the glass from which they were made, coloured glasses requiring different temperatures from plain, and different colours requiring different temperatures from each other. The mechanical details also require contant re-adjustment, precautions having at first to be taken to insure good results from workmen unaccustomed to manipulate the process. All these differences have now been reconciled, and the workmen have been educated to their task, which they perform with alacrity and intelligence, although at first they were disposed to regard the process as an innovation. On seeing the remarkable results produced by it, however, they were assured of its value, and now evince a thorough interest in their work, even vieing with each other in dexterity of manipulation.

The glass furnace is of the ordinary form—that is to say, circular, with several openings around it, from some of which the molten glass is taken, while into others the manufactured article is thrust previously to being tempered. The tempering process consists simply in plunging the heated glass articles into a bath of heated fatty matters, allowing them to partially cool therein, tranferring them to a hot room, and thence to a bath of heated alkaline solution, and afterwards to a bath of hot water, and subjecting them to a final washing. The tempering bath is a cylindrical iron vessel about two feet six inches high and two feet in diameter, carried on wheels, and containing the hot fat, which has to be kept at a certain known and exact temperature. These baths are placed conveniently for the workmen around the furnace, and as the temperature of their contents becomes raised by the presence of the highly-heated glass, it is lowered to the normal condition by a supply of fat from a vessel which is kept heated by a small furnace. Within the bath is suspended a wire basket, which receives the articles as they are dropped into it, and by means of which they can be removed when necessary, altogether, instead of each one having to be fished out singly. The glass articles are either blown or moulded in the ordinary way, and when finished by the workman, and while still hot, are taken away one by one by boys on the end of an iron rod called a pontil. The end of the pontil is first dipped into the molten glass, and then into sand, and the glass article then adheres to it. We will assume the article under treatment to be an ordinary glass tumbler; the boy holds it in the furnace for a few seconds, until it is of a cherry red heat. A workman then takes it from him, and, and holding it at angle of about 45° over the bath, gives the pontil a slight tap, which causes the tumbler to become detached and to fall into the bath. A slight hiss and a puff of white smoke from the bath are the only external indications of the remarkable change which has now commenced in the physical constitution of the tumbler. Before it entered the bath, had it been allowed to cool, a grain of sand falling into it, or at the most a scratch made upon its surface, would have caused it to be shattered into a thousand fragments. Now it is silently undergoing that remarkable change which will enable it to resist, not only violent shocks from falls, but the effects of repeated firing at with bullets from a small rifle, as we shall presently see.

The bath having become filled, or nearly so, with tumblers, it is wheeled aside and allowed to cool gradually for two or three hours, according to the nature of the contents. At the end of that time the basket, with its load, is lifted out, and the tumblers placed in wire trays. As these trays are filled, they are removed to the hot room, which is maintained at a certain even temperature by means of a furnace and surrounding flues. After remaining in the hot-room for half an hour—according to size and thickness of the articles—the trays of tumblers are removed to a bath of strong alkaline solution, maintained at a temperature just below boiling point, and in which they are cleansed from the fat which still adheres to their surfaces. After an immersion of from half an hour to an hour they are removed to the water bath, where they are allowed to remain for a similar time at a similar temperature, in order to cleanse them from the alkaline solution. They are then subjected to a final washing in clear water, and are then removed to the sorting department, where they are assorted according to size and finish, some being less perfect in shape than others, or possessing some slight defect which places them in a cheaper class of goods.

Following the tumbler in its course, we next come to the grinding department, where they are received in batches from the sorting-room. On being detached from the pontil the tumbler has a roughness at the bottom, as also have the other articles, sand also adhering thereto. It is to clear away this roughness and to enable the tumbler to stand square that the grinding process is required. The operation is performed by men and women at wheels placed in rows down the room, the wheels being driven through shafting and belts by a steam engine. The tumblers are first rough ground on disc wheels of cast iron, revolving at high speeds. They then receive a second grinding upon wheels of sandstone, and are finally polished on cork wheels as in the ordinary process of manufacture. They are then removed to the packing department, where they are cleaned, wrapped in paper, and sent away to the store ready for the market. In the case of engraved goods, the glasses, or whatever the articles may be, are sent to an engraving shop close by, which we also visited, and where we found monograms and elegant devices and patterns being produced on the tempered glass by the wheel. The glass can likewise be engraved by means of hydrofluoric acid.

Such is the interesting and ingenious, yet simple, process which M. de la Bastie has laboured long and earnestly to develop into its present satisfactory commercial condition. It is most gratifying to know that he has effected his object, although, we regret to say, that in accomplishing it he has seriously impaired his sight, which years of peering into the glass furnace have partially destroyed. In the ordinary process of annealing by the leer as previously practised at Choisy le Roi, the time occupied was from fifteen to thirty hours, in addition to which there was a heavy coal bill and constant loss from breakage, while the leer and its furnace occupied a large amount of space. On the other hand, a few small iron cylinders replace a great brick structure; the time for each batch is at the most from six to eight hours; a small quantity only of coal is required to keep the store, bath of fat, the hot room, and the washing baths heated, and that at low temperatures, and all broken glass goes back to the furnace.

(To be Continued.)

The Photographic News.

Vol XX. No. 931.—JULY 7, 1876.

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THE EDINBURGH PHOTOGRAPHIC EXHIBITION.

As in our last issue we called especial attention to the unusually magnanimous conditions upon which the members of the Photographic Society of Edinburgh invited their photographic brethren to contribute to their exhibition, and compete for the prizes which they offered, it is necessary that we should briefly call attention to a modification in these conditions made at a subsequent meeting, the proceedings of which will be found reported on another page. In our last, after expressing a high appreciation of the self-denial on the part of the Society in giving up all chance of medals in order that no possible suspicion of partizanship had governed their distribution, we remarked that objection might not unfairly be taken by members of the Society that, whilst providing the sinews of war, they were prohibited from receiving any of the trophies of victory. That to which we referred as a possibility, has, it seems, turned out a practical reality. The decision of the meeting which we reported last week has been called into question, and at another special meeting, held on Monday, the decision disqualifying members of the Society and Edinburgh photographers generally for competing for medals was rescinded. The medals, already announced, will therefore be open to the competition of photographers everywhere, from Land's End to John O'Groats, or, indeed, we presume, in all parts of the world.

We cannot help feeling some regret at the change in the decision; not only because some temporary warmth of feeling was engendered in the discussion, but because the arrangements as they stood furnished an example of a noble and chivalric generosity, a sublime self-abnegation, which was as charming and edifying as it was rare. The stern self-repression which could resolve to distribute honours for excellence, but receive none, however strong the claim or certain the chance of winning in an open race, was, as the final issue has shown, too good to be true. It is an honour to the Society, however, to include amongst its members even a minority of men so minded to make sacrifices to prevent discord. But, on the other hand, there is no discredit on the other side in standing for what is clearly justice. It was undoubtedly hard measure to be debarred from entering an honourable competition because of living in the city where it must take place, or, if living elsewhere, because of belonging to the Society distributing the honours: and we can readily conceive many minds rebelling at such conditions, not from a niggard spirit, or any absolute lack of generosity, but from a feeling of injustice, possibly a feeling even of humiliation, at being so debarred. All honourable men intending to compete will, we feel sure, be glad that this limit to the competition is removed, and will the more gladly enter the more extended competition; and we once more bespeak amongst our readers a hearty interest in the project. We trust also that the slight skirmish just over will constitute the only discussion in connection therewith, and that when the awards are made they will be received as the unquestionable expression of an honest and impartial judgment.

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PHOTOGRAPHY AT THE AMERICAN EXHIBITION.

THE photographic department of the Centennial Exhibition held at Washington ought to be one of the most successful displays of photography yet held, if the energy and effort of those under whose management it has been brought together have been duly seconded by photographers in all parts of the world. We fear, however, that the great distance between the Old World and the New, together with the difficulties which that distance imposes, have materially restricted the contributions from this country and Continental Europe. The American photographers have, however, contributed very extensively, and sent a great deal of fine work upwards of two-thirds of the contributions being the work of American artists. The hall devoted to photography, although 240 feet long by 75 feet wide, was finally found to be too small to do justice to all the contributions sent in. On the opening day the photographic display was far from being ready, but has been rapidly got into good order. Every form of photography, plain and finished in various styles, is admitted, even drawings in charcoal by a photographer being admitted. Amongst the American pictures, a series sent in by Mr. Landy, of Cincinnati, attracts especial attention. The subject illustrated is Shakespeare's "Seven Ages," described by Jacques in "As You Like It." The successful issue of this ambitious effort has called for general admiration, and has been extensively noticed in the outside press. The pictures are twenty-four inches by twenty in size, backgrounds and accessories of various kinds having been especially prepared for the series. One of the American daily newspapers remarks: "Those who have doubted that it is within the possibilities of photography to reach the realms of high art have been pretty emphatically answered in the affirmative by Landy, of Cincinnati, in his contribution to the Centennial." We hope shortly to be able to give some account of the contributions from this side of the water.

The display of apparatus and photographic appliances is very good. The Scovill Manufacturing Company exhibit almost every possibility in photographic requirements. We regret to learn that from some mistake, in which red tape is largely involved, a very large and handsome cabinet of photographic apparatus and appliances, erected by Messrs. Anthony and Co. purposely for the exhibition, was found at the last moment to be inadmissible in the photographic hall. It will, however, be doubtless seen by most of those interested, as it is on view at Messrs. Anthony's establishment in New York.

Referring to the appliances for astronomical photography exhibited, a correspondent of the *Athenæum* says:—"Fifty feet south of the transit stands the photographic house, measuring ten by twelve feet. The interior serves not only as a dark room, but also as a camera. The photographic telescope is forty feet in length, projecting horizontally from its northern side in the meridian of the transit instrument, the sun's rays being reflected into it by the mirror of a heliostat. The photographic telescope is destitute of a tube, its object glass being supported on an iron pillar, which also carries the heliostat. Within the house there is a second iron pillar, which carries the sensitive plate, upon which the sun's image is formed. A short tube and two screens are so arranged that, except the object glass, only black surfaces are visible from the sensitive plate. The lineal length of a second of arc on the plate is determined by measuring with an iron standard rod the distance between the optical centre of the object glass and the surface of the sensitive plate. Immediately in front of the latter, and between it and the object glass, stands a glass reticule plate, ruled in squares, an image of which is impressed upon the sensitive plate, together with the image of the sun, in order to detect any shrinkage which may take place in the drying of the collodion film. The photographic telescope, being placed in a line with the transit instrument, may be considered as a collimator to the latter, and the reticule plate is visible through the transit instrument, by means of which the axis of the photographic telescope is placed accurately horizontal and in the meridian. Besides these, the photographic house contains the usual sink, bath, and paraphernalia for taking pictures by the wet collodion method."

Referring to the doubts felt as to whether the exhibition generally will pay its expenses, which average 8,000 dollars daily, the correspondent of the *Times* says:—"Since the first of this month a very American precaution has prevented the possibility of free passes being lent to people not entitled to them. Every such pass must have on it a photograph of the lawful owner duly accredited with an official stamp. This precaution was at first warmly resented in certain quarters, and there was some fiery writing about the indignity of being treated as criminals are treated by the police. But, considering that somewhere about 13,000 free passes were issued, not only the exhibitors, but all the servants and other employés about the grounds requiring one, it was impossible to suppose that the privilege might not be by some abused, and, as a matter of fact, it was at first abused, several tickets having been forfeited in consequence of being presented by the wrong persons. It would have been a somewhat delicate task, to say the least, for the Commissioners to pick out the honest people who could be trusted without photographs, or to make, let us hope, shorter work, the dishonest people who could not be. This would, indeed, have been to constitute a 'rogues' gallery' with a vengeance. The photograph is so fastened and stamped that it would be very difficult, if not impossible, to substitute another for it. The plan might, I think, with advantage, be more generally used. People travelling through foreign countries in troubled times would occasionally save themselves from annoyance, and even arrest, if they had so simple a means of satisfying the police that their passport was their own."

The authorities of the National Photographic Association have called the Annual Convention, which has been in abeyance, for Philadelphia this year, and a special effort has to be made to revive the Association and restore its pristine vigour, various stirring addresses having been issued to its members and photographers generally. One of the special efforts to excite enthusiasm will probably cause a smile amongst undemonstrative people on this side, but will come naturally enough to an impulsive people free from any affectation of the *nil admirari*. The local secretary of the Association sends forth a request to all members to prepare for their visit by rehearsing the national song of the "Star-spangled Banner," so that it may be sung by the Convention *en masse*. An especial edition of the song, at ten cents. per copy, is issued by a photographic publishing firm especially for the occasion.

PHOTOGRAPHY AT SOUTH KENSINGTON.

It would be difficult for the most enthusiastic optimist to regard the scientific exhibition at South Kensington a great success. There is a splendid collection of scientific appliances ill-arranged, ill-displayed, ill-catalogued, and attracting comparatively a small number of visitors. The conferences or lectures, especially those arranged to take place during the day, are so ill-attended that visitors at times require to be "drummed up" to the spot to form any approach to an audience, and so secure the delivery of the lecture. This is discouraging to the lecturer, and does not promise much instruction to the public as the result of the project.

On the forenoon of Monday week, Mr. Dallmeyer delivered an explanatory lecture on his lenses, and the optical principles involved in their construction, to a limited audience, illustrating his remarks by diagrams on the black board. We give a brief *precis* of the lecture.

The exhibits were grouped under the following heads:—I. Lenses for Astronomical Photography; II. Lenses for Self-recording Instruments; III. Lenses for Copying Maps and Plans; IV. Lenses for Portraits and Views.

Under the first was comprised the photo-heliograph and a four-inch rapid rectilinear. Mr. Dallmeyer explained the difference between the construction of a telescope for visual purposes and the photo-heliograph, *i.e.*, what is meant by coincidence of chemical and visual foci; that the aperture of a telescope generally does not exceed $\frac{f}{15}$ and the angle of degree is but 1° or 2°. This is insufficient for photographing the solar coronæ during eclipses, for which a four-inch rapid rectilinear has been successfully used, the aperture of which is $\frac{f}{8}$, and the angle of fixture extends far beyond the coronæ. The second heading comprised lenses of very large angular aperture, $\frac{f}{2}$ used for barograph, thermographs, &c. Under heading III., he explained the "nature of distortion," and referred to the lenses free from this defect; as the triple achromatic lens, the first lens was practically useful for copying maps and plans, and used at the present time in almost every Government topographical establishment, up to three feet square. Next in order, double combination symmetrical lenses were referred to, as the rapid rectilinear, and their construction explained.

Under heading IV., portrait and view lenses came under review. The labours of Petzval, Voightlander, Andrew Ross, and others were dwelt upon. The qualities required in a portrait combination were pointed out, and how in a Dallmeyer's new form of portrait lens these qualities were obtained, the aim being to combine the good points of the Petzval construction, as it regards sharpness of definition and rapidity of action, with the additional advantages of freedom from distortion and flare, and depth of focus at the will or disposition of the artist, if he chooses to avail himself of it.

View-lenses were next dealt with,—*i.e.*, the single combination composed of three lenses cemented together, was described, and its merits for pure landscape photography dwelt upon. It produces but one disturbing reflex image, whereas a double combination has six; hence the greater brilliancy of pictures taken with the single combination. A double combination, including angles of pictures of 90°, for special requirements, such as confined situations, was then shown, and the extreme thinness of the combinations forming this lens was dwelt upon as preventing absorption of the light in its passage, as well as reducing astigmatism of the very oblique pencils, &c. Answers to some questions put by the audience concluded the lecture.

On the following day, Mr. J. R. Sawyer lectured on the printing processes of the Autotype Company, under similar difficulties as to audience. Instead, then, of giving a formal lecture and demonstration, he entered into a familiar and conversational description of the principles of photography, and on positive carbon printing as an important advance upon other modes of printing, the results of which had been, as many of the public knew too well, of a fleeting character. This familar chat was probably more instructive, as well as more pleasant, than a more formal lecture would have been.

PROVINCIAL PHOTOGRAPHERS IN AMERICA.

Mr. A. Hall, at the Chicago Photographic Association, gave some account of his observations during a ramble through several small towns. He said :—During my travels through the country the past few months, I have made it my business to visit the photographers whenever time would admit, and I must say right here that I am somewhat discouraged for the future of our art science, unless we can improve the average professional as I have seen him. In the smaller towns they are not producing as good work as they were ten years ago. In the larger towns I found some improvement. I will give you an example of one of many I met. In a town of some two thousand inhabitants I found a photographer and time to pay a visit; stopped and looked at the specimens hung at his door, and among them noticed some India-ink work. I found the artist in his studio, and busy retouching a negative of a copy. After the usual introduction I remarked something about his employment. He replied, "Yes, an artist can't do anything now-a-days without retouching." He was very proud of his talents as an artist. I noticed in the negative he was working on a hole about the size of your thumb nail, and remarked, "You have quite a transparent spot in your negative?" "Yes, but I can easily fix that," and he proceeded to smoke the spot over a lamp, and that fixed it for him. He called my attention to his India-ink work, and was anxious that I should compliment him on the drawing, but I was loth to encourage the genius, and departed without adding to his conceit. I duplicated this specimen many times, and have wondered not a little at their number, but think they flourish because the public have not the culture to support a good workman. Here is a specimen taken from another State. He gave me the following account of his introduction to our art. "Have been picturing nigh on to fourteen years. I was driving a team, drawing stone, and a man came in town making pictures. He had a powerful run. He told me he would learn me, and sell out his traps for one hundred dollars. I thought it a good chance and went in. After staying one day, I told him I thought I could run the concern, and he left. Have never had any instructions in photography; learned it all out of a book. I hear about the trouble artists have in printing, but I never have any bother." The artist talked on in this strain for some time, and I kept busy observing him and his work. I was satisfied his statement was true: that he had never had any instructions, and further, that he was not bothered in his printing, but his specimens witnessed all he said, and more. I found many running low prices—one dollar per dozen for cards—and doing all they could to cut each other's throats and get themselves into the poor-house. I will not take up further time with examples of the kind brought before you, they are far too numerous, and I earnestly hope for improvement. How this improvement can be brought about I am not prepared to say, but let us give the matter attention, and if these societies are of any use, let them do what they can to elevate and improve the status of photography and photographers. I found all were interested in the journals and associations, and think we can reach them if we try.

UPON IODIZING COLLODION.

BY DR. JOSEF MARIA EDER.*

By the employment of three separate iodizing salts it is easy to obtain iodizing liquids containing every desired relative proportion of bromine and iodine, and yet having *only* double salts. This is shown by the following equation :—

$$19\,Cd\,J_2+12\,NH_4\,Br+22\,NH_4\,J=4\,(NH_4\,Br\,Cd\,Br_2)+15\,(2NH_4\,J\,Cd\,J_2),$$

in which you obtain a solution of one atom of bromine for every five atoms of iodine; that is to say, by the simultaneous solution of 69·5 grammes of iodide of cadmium, 31·9 grammes of iodide of ammonium, and 11·8 grammes of bromide of ammonium, you secure the same solution as from 103·8 grammes of crystallized double iodide of ammonium-cadmium, and 15·2 grammes of simple bromide of ammonium-cadmium. Exactly the same iodizing liquid may be secured by dissolving iodide of ammonium, and iodide of cadmium, and bromide of cadmium.

$$34\,NH_4\,J+6\,Cd\,Br_2+13\,Cd\,J_2=4\,(NH_4\,Br\,Cd\,Br_2)+15\,(2\,NH_4\,J\,Cd\,J_2);$$

that is to say, with 49·3 parts of iodide of ammonium, 47·6 parts of iodide of cadmium, and twelve parts of crystallized bromide of cadmium, you obtain the same solution as from 103·8 parts of the double iodide of ammonium-cadmium, and 15·2 parts of bromide of ammonium-cadmium.

The salts mixed in accordance with the equation :—

$$22\,NH_4\,J+6\,Cd\,Br_2+7\,Cd\,J_2=4\,(NH_4\,Br\,Cd\,Br_2)+9\,(2\,NH_4\,J\,Cd\,J_2),$$

represent a solution containing iodine and bromine in the proportion of three atoms to one.

By means of these illustrations I trust that I have shown how the composition of iodizing salts in collodion may be calculated. It is easy to find out, when various salts are mixed, which of them, and how much, are present as double salts, and which are simple ones. The most iodizing solutions, made by means of bromide and iodide cadmium and ammonium salts, consist, as the above equations show, of simple bromide of ammonium and cadmium, double iodide of ammonium and cadmium, and free iodide of ammonium. For this reason, the opinion entertained by some that the formation of double salts is unnecessary in iodizing salts is seen to be erroneous, as these are found in the collodion from the simple salts. The simple salts do not keep, while the double salts, on the other hand, are very durable, and the employment of ammonium-cadmium salts has, at any rate, this point in its favour; while, again, it is some advantage to employ only two preparations instead of at least three.

In this place I may refer to a very interesting observation made by Toth and myself, to the effect that collodion which contains more iodide of ammonium than cadmium salt may have its sensitizing salts transformed into the double iodide of ammonium-cadmium; in other words, that collodion which, besides the double salts of ammonium-cadmium, contains free iodide of ammonium, is liable to a more rapid decomposition, but at the same time more sensitive, than collodion iodized with double salts. The liability to decomposition increases with the contents of free iodide of ammonium, a conclusion, indeed, borne out by our previous experiments. The sensitiveness is not increased by augmenting the quantity of iodide of ammonium, but soon reaches a certain limit which must not be overstepped.

We compared collodions which contained :—

A. A solution of one part simple bromide of ammonium-cadmium, and 5·8 parts of double iodide of ammonium-cadmium.

B. A solution of one part of double bromine salt, four parts double iodide of ammonium-cadmium, and 1·5 part of iodide of ammonium.

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* Continued from page 268.

C. A solution of one part of bromine double salts, 2·2 parts of iodine double salt, and three parts iodide of ammonium.

D. A solution of one part bromine double salt and 1·8 parts of iodide of ammonium.

All four collodions were similar as regards the equivalent of bromine and iodine salts which they contained. After six months D was tinted the deepest colour, B and C less, and A least of all.

By the addition also of bromide of ammonium to the double iodide of ammonium-cadmium you may set free iodide of ammonium, simple bromide of ammonium-cadmium being formed. The process is explained by the following equation, the exactness of which I have verified by crystallizing the salts out of the alcohol and examining the crystals :—

$$2\,NH_4\,Cd\,J_2 + 3\,NH_4\,Br = NH_4\,Br\,Cd\,Br_2 + NH_4\,J\,;$$

that is, three molecules of bromide of ammonium (29·4 parts by weight) make one molecule (69·2 parts) of the double iodide of ammonium-cadmium, four molecules (58 parts) of iodide of ammonium, with simultaneous formation of one molecule (37·9 parts) of free double bromide of ammonium-cadmium.

A collodion was next prepared by mixing three volumes of normal collodion with one volume of a solution of 2·2 grammes double iodide of ammonium-cadmium, and 0·3 gramme of bromide of ammonium, in 50 cub. cents. of alcohol. The result was a collodion which contained 0·39 gramme crystallized ammonium-cadmium, 1·5 gramme double iodide of ammonium-cadmium, and 0·6 gramme iodide of ammonium. This collodion resembled B a good deal, therefore, and we have at once an illustration of how the same iodizing solution may be obtained with different salts. A comparative examination of the collodion showed that B, C, D, and E, were more sensitive (about $\frac{1}{6}$ to $\frac{1}{4}$) than A. No differences in the sensitiveness of B, C. D, and E could be discovered; but B, C, D, and E, were more quickly tinted than A (B, C, and E, were similar in this respect to ordinary portrait collodions containing ammonium and cadmium salts) and they coloured the more rapidly the greater the amount of free iodide of ammonium contained in them.

(To be continued.)

Correspondence.

PATENT FOR PELLICLES.

Sir,—Mr. G. Smith misapprehends my argument, which was that the patentee starts with gelatine pellicle already patented by Nelson. He reduces this to the fluid state in which it was previously to the application of Nelson's patent. He then adds silver bromide to it, and then steps in with a patent claim for again reducing it, *plus* the silver, to the state in which Nelson had brought it previously without the silver which he (Mr. Kennett) had started.

I cannot, therefore, help thinking that this is practically an infringement of Nelson's patent, and has no claim to protection on its own account.

But, sir, leaving altogether the question as to whether it ought to be the subject of a patent, I think I can show you that such patent is invalid, and for the simple reason that it is not new, but that the identical second drying of the gelatine after an addition has been made to it has been practised for years by Messrs. Savory and Moore, her Majesty's chemists, who supply the medical profession with small gelatine discs, each containing a definite weight of some active chemical. Thus the oculist carries in his pocket-book small discs of gelatine, containing atropine, one of which he puts under the eyelid to dilate the pupil of the eye; others contain a certain quantity of morphia, which can be dissolved in two or three drops of water, for injecting beneath the skin; and many others of the same kind are and have been manufactured in a similar way by dissolving gelatine, adding the chemicals, and again drying. I don't think Messrs. Savory and Moore have patented this very useful plan, but if they have, either Mr. K. has infringed their patent, or they his, and it becomes a matter of priority in which Messrs. Savory and Moore have by some years the advantage of dates.

To the close and cogent letter of Colonel Stuart Wortley in last week's News I have nothing to add. To me it seems unanswerable.—Yours, &c., Photo-Chemicus.

Erratum.—Last week's News, page 299, line 12, for "trying," read "drying."

Sir,—Your leading article of last week gives a very fair statement of Mr. Kennett's patent up to a certain point. I find that you concede that the publication of the way to make a gelatine emulsion, and to convert the said emulsion into a solid pellicle so that the redundant chemicals may be washed out of it, was clearly made before the date of Mr. Kennett's patent, and that his patent is a copy of what had been published; but you then say, here we must stop, because Mr. Kennett dries his gelatine pellicle, and that constitutes invention. Let us, then, see from whence he "invented" the drying. Will you kindly print side by side an extract from Mr. Nelson's patent for the manufacture of gelatine, and an extract from Mr. Kennett's patent? and I think that some further light will then be thrown on the question.

Extract from Nelson's Patent, A.D. 1839, *March 23rd, No.* 8010.	*Extract from Kennett's Patent, A.D.* 1873, *November 20th, No.* 3782.
When the gelatine has been thus completely dissolved, I pour it again upon the cooling slabs as before, and I allow it to remain until it again becomes cold, and sets into a firm substance; I then cut it into pieces of any convenient size, and dry it upon nets by exposure to a current of cool dry air, and, when it has been thus completely dried, it is fit for use.	Then the said compound or substance is allowed to stand until it becomes cold; it is then removed by stripping it from the said dishes, and is placed in suitable frames in a drying closet in which a circulation of dry air, either warm or cold, is maintained, whereby the drying or desiccation is completed.

Now, sir, I think this opens a grave question of public policy. Mr. Kennett in the autumn of 1873 was working at gelatine emulsions, and when, on the 14th of November, Mr. Johnston's valuable idea was published, Mr. Kennett appears to have seen its value, and at once taken it to the Patent Office, where his specification was deposited on the 20th of that same month; but, as you say, the idea also struck Mr. Kennett that his pellicle ought to be dried, and he had not far to go to find out how that should be accomplished. The indexes of specifications in the Patent Office Library would lead him at once to Mr. Nelson's patent, and the extracts printed above will show how closely he has followed it.

Now, it is a grave question whether this is dealing fairly and honestly with the photographic public. Mr. Kennett shows no invention whatsoever, but is merely seized with the idea that the outcome of other person's brains might be worked commercially for his profit, and I submit that in this case an improper attempt has been made to take a process from the photographic public which is legitimately its property, and to seal it up for the commercial benefit of one individual who had nothing to do with inventing or discovering any part of the process in question.

I do not fail to see that it is possible that Mr. Kennett had also independently discovered what Mr. Johnston had published, but, if so, I may call your attention to the fact that Mr. Kennett's patent is signed (as a witness) by Mr. W. R. Lake, a partner in the well-known firm of Messrs. Haseltine and Lake, of 8, Southampton Buildings, and that if Mr. Kennett can produce testimony from that firm that his (Mr. Kennett's) specification was in their hands prior to the 14th November, he will probably have been a contemporaneous discoverer with Mr. Johnston, and it will become my duty to retract what I have above conveyed to be my impression. That impression is—and I think I am justified by the facts and dates in holding it—that Mr. Kennett, seeing the commercial value of what Mr. Johnston published, and that that commercial value would be increased by tacking on to it what Mr. Nelson had also published as to drying, attempted, without adding any inventive idea of his own to it, to take the process, and patent it six days after Mr. Johnston's publication, for his own benefit; and did, in so doing, an act of wrong doing to the photographic public. If such acts as these were to be tolerated without someone speaking up for the rights of the public, it would be impossible to publish any novelty, as other people might then act in the same manner as Mr. Kennett has done.—Yours, &c.,

H. Stuart Wortley.

Dear Sir,—I feel that I ought not to let Col. Wortley's letter in your last issue pass without saying a few words on points within my own knowledge. He commences by giving the contents of a letter, bearing date of six days previous to the date of Mr. Kennett's patent, relative to gelatine emulsions, and if my memory serves me rightly it is not the first time he has put the same letter forward as evidence against Mr. Kennett, to prove that prior discovery belongs to another. I may say, in passing, that I have known Mr. Kennett for many years, and have always known him to be a gentleman of great ability and care as regards researches in photographic matters. I was at his house some months before a gelatine emulsion process was even published, when he showed me plates that he had been experimenting with several years before, and also his note-book containing his experience in the matter up to that time, so you will see that Mr. Kennett is not guilty of cribbing information from other people and patenting the same, which I take to be the meaning of Col. Wortley's letter. I was sorry I was not at the meeting when Mr. Kennett was placed, as you observe in your leader of last issue, in an unfair position, or I certainly should have made the statement at the time that I do now. I can now see that the cause of Mr. Kennett's failures at the time arose from the fact that he took the extreme sensitiveness of his plates for fog. In those days dry plates were very slow indeed, as every one will admit. Then, again, further on, the Colonel asks in his letter, what is Nelson's gelatine, and all other forms of gelatine? Why, certainly, it is not sensitive to light, and neither do any of the manufacturers of gelatine pretend that it is; and I think that Mr. Kennett's *invention* of desiccating the *sensitive* emulsion, and supplying it to photographers in that form, was a great step in advance, and was a great boon to photographers, for which, I think, the photographic public are greatly indebted to Mr. Kennett in bringing it before their notice. I admit that Mr. Kennett does not often publish his experience, for one simple reason, and that is, he, like a great many more, does not care to lay himself open to being pulled to pieces in the photographic papers, a thing too frequently the case when any one advances a new truth or theory in photographic matters. But I have always found Mr. Kennett ready and willing to impart anything and everything he knows in photography. I, at least, can speak from experience, and can add, that the information he gives to any one is always reliable.—I am, dear sir, yours truly,

Abergavenny, July 4th. W. Brooks.

PROTO-NITRATE DEVELOPER.

Sir,—Although I am not able to affirm your statement as to the exact date of the introduction of nitrate of iron as a developer, I can fully bear out all you say as to the beauty of the positives produced by this means. About 1857 I produced many positives with the nitrate, using the baryta salt in its composition. It was always a source of wonder to me, considering how many glass positives were taken, that I found so few using this means of producing them. It was probably due to the circumstances that the developer required some little trouble, and took some time to make, owing to the difficulty in effecting solution of the baryta salt, which, if I remember rightly, was dissolved in boiling water; and also to the fact that the solution did not keep well, soon changing from the transparent apple-green tint to a dingy yellow, and losing by this oxidizing its power of developing. As to the beauty of the products, they far exceeded anything except the finest of Daguerreotypes, being full of detail and gradation. They required a somewhat longer exposure also than the positives produced by other developers, which was, I suppose, regarded as a disadvantage. If any of your amateur subscribers were to try this process, they would find the result very pleasing. The formula for the baryta developer, as I remember it, is as follows:—

Nitrate of baryta ...	1 ounce
Nitric acid	2 drachms, s.g. 1·4
Protosulp. iron ...	1½ ounces

In making up the developer, proceed as follows:—1st Dissolve the baryta in sixteen ounces hot water, shake up well till dissolved, then add the nitric acid as above. Powder the protosulp. iron in a mortar, then add to the solution, and shake all well up till dissolved. Filter carefully till solution is quite clear, then add two ounces of alcohol. Keep in the dark, otherwise it changes rapidly.—Yours, respectfully, B. L.

SYPHONS.

Dear Sir,—In your issue of the 31st March (excuse me for going so far back, and reviving an old subject) is an interesting letter in which "Gustavo" describes a syphon which can be used for emptying dishes, &c, without sucking the solution into the mouth.

He also gives a sketch which gives an excellent idea of its form; he also says it only cost him sixpence; but he does not tell you how to make it, nor give the dimensions best suited for its purpose.

It seems easy to make, all but attaching the piece which he puts into the mouth, for, being glass, I can't see how it is easily welded on to the syphon proper, and all to be made for sixpence. Glass tubing is a ticklish thing to manipulate, requires great heat to melt, and, I should think, necessitates considerable skill to successfully form to the required shape.

If "Guestavo" would kindly give in your columns the information sought, he would confer a favour. Apologising, also, sir, for troubling you, I am yours,

Ignoramus.

THE COMING EXHIBITION IN EDINBURGH.

Sir,—Under the above heading some very excellent remarks are made by a correspondent, who signs "B.," and he gives every possible assurance to intending exhibitors that they may expect the most desirable arrangements for the conduct of the said exhibition, and all matters appertaining thereto.

It is evident that "progress in art photography" is that which of all things is kept in view, and to be illustrated as far as it can be done. It may be added that any step taken with a view to such an end must prove gratifying, instructive, and consequently beneficial to the whole body of professional photographers and others more immediately connected with the northern metropolis.

As your correspondent gives some good reasons why "coloured work," as it is termed, should not be admitted, it may be asked whether the interests of those for whose advantage the exhibition is principally intended could not be ignored in denying admission to a style of portraiture so extensively patronised by the public in this country. There is one way in which the difficulty could be overcome, by simply adopting the plan of classification, which, as far as I am aware of, has not been pursued by any society; it might thus be optional to the "superior class of visitors" whether they spent any time over "coloured photographs," plain photographs, landscapes, or carbon productions. By this arrangement of "classification," enabling the visitor to examine and compare at leisure homogeneous works, all might find their convenience satisfied. To make my meaning clear, I think that carbon and silver prints should be kept distinct both in portraiture and landscape, and that where equal merit exists pictorially, the palm should be given to carbon, on the simple plea of improvement and progress. We have seen all that it is possible to imagine in photography, both at home and abroad, produced by the old methods, and very little progress, if any, can be expected in that direction.

If, in addition to the wise enactment of the council of the Edinburgh Photographic Society, which sets forth that "exhibitors resident in Edinburgh, or who are members of the Society, shall not be entitled to compete,"[*] it can be managed to group the exhibits according to the different processes which they represent, instead of the medley so frequently presented at exhibitions of a similar kind, where portraits, landscapes, architecture, and other subjects are placed too often in close proximity, the arrangements warrant the desirable distinctions suggested, there can hardly be a doubt as to the satisfaction which will be experienced by visitors in general, but more particularly by those who intend to study their art earnestly and with profit to themselves.

It is a matter for great congratulation to find the council endeavouring by all means to arrive at that most to be wished for consummation set forth in your last week's article, and embodied in the following words, which every one will be happy to echo:—"That the Edinburgh Exhibition shall be one of the best which has ever been held, not only in the modern Athens, but in the world."

Such is the sincere hope of an Intending Exhibitor.

THE NITRATE OF IRON DEVELOPER.

Dear Sir,—Your leader of the 16th June, and Dr. Diamond's letter in the last number of the News, seem to call for some kind of explanation on my part, and I beg to assure you at the outset that nothing was further from my thoughts than to attempt to deprive Dr. Diamond of any share of the credit which rightly attaches to him as being the introducer of the proto-nitrate of iron for developing collodion positives.

When occupying the chair at the last meeting of the South London Photographic Society, I took occasion to point out the close analogy of Mr. Brooks's new instructions for preparing the developer with the old formula of the Rev. J. Lawson Sisson, wherein nitrate of lead was employed for effecting the conversion of the ferrous sulphate into the corresponding nitrate. The discussion had no reference to the historical use of this salt in photography, or Dr. Diamond's name would have been mentioned; but my object was to point out a chemical advantage in the substitution of common saltpetre (potassium nitrate) for the lead salt proposed to be employed, and in this way to avoid filtration.

Dr. Diamond and yourself are quite right in saying that it is difficult to suppose that I could forget the circumstance of his early suggestion of this salt. I had not forgotten it, for it was clearly in my mind at the moment of addressing the Society, and I also perfectly well remember my first meeting Dr. Diamond at the studio of Messrs. Ross and Thompson, in Edinburgh, twenty-two years ago, and our conversation on this head; but, as I said before, the topic was not who introduced the proto-nitrate, but who first suggested the particular formula (with lead) which was just then under discussion. This I certainly attributed to Mr. Sisson, without going back to state that Dr. Diamond's prior publication might very possibly have led the way to the production of the proto-nitrate by the special means which Mr. Sisson and (now) Mr. Brooks prefer to employ, viz., by effecting the double decomposition of green vitriol by the nitrate of lead.

This letter appears already to have exceeded the limits of explanation you may be inclined to allow, and I confine myself, in conclusion, to reiterating the fact that Dr. Diamond's claim is good, but did not really come under discussion during the course of our proceedings; and, as you have said already, I had previously acknowledged the fact in print when addressing, in 1853, my original communication to the *Journal of the Photographic Society.*—I remain, dear sir, yours very truly, John Spiller.

[We are glad to publish Mr. Spiller's explanation of the apparent injustice to Dr. Diamond; the error, it seems, was simply a verbal one, for Dr. Diamond, as introducer of the proto-nitrate developer, at the time of referring to the subject, was in Mr. Spiller's mind. Unfortunately, intending to refer to nitrate of lead only, he mentioned Mr. Sisson's name only, and as in the reports of both journals the report appears stating that the latter gentleman introduced the use of proto-nitrate, it was manifestly necessary that the correction should appear.]

DR. VOGEL'S COLOUR THEORY.

My Dear Sir,—Will you kindly note in your next issue the following corrections (necessitated by printers' errors, and illegible caligraphy, probably), that should be made in my last communication to the News. Many sentences, as they now stand, read as nonsense.

Page 308, 2nd paragraph, line 9, for "colour film" read "colour theory"; 2nd paragraph, line 15, a full-stop should be placed after "contend," and omitted in the next line after "emulsion"; 4th paragraph, line 3, for "necessary action" read "reversed action"; 5th paragraph, line 4, for "iodine" read "eosine"; 6th paragraph, line 5, for "surpassed" read "impressed"; 6th paragraph, line 6, for "these plates" read "resin plates"; 7th paragraph, line 4, for "this is the least time which I can obtain" read "as C is the last line which I can obtain"; 7th paragraph, line 10, for "A" read "*a*"; last paragraph, line 3, for "mechanical" read "chemical."

Whilst writing, allow me to say that when exposing through the coloured glass I purposely included in the picture a black board with square of blue, red, and orange papers pasted on it. The blue impressed no image on the film, and could not be distinguished from the black board, whilst the red and yellow (the latter not being a monochrome) impressed themselves vigorously. From an article in the *American Journal of Science and Arts*, which has been reprinted in your photographic contemporary, it appears that Mr. Carey Lea's views of the colour theory and my own are similar. I quite agree with that gentleman as to the necessity of employing coloured glasses in experiments on this subject, though I think the spectrum photographs should be obtained as well.—Yours faithfully,

W. de W. Abney.

Proceedings of Societies.

Edinburgh Photographic Society.

A special meeting of this Society was held in 5, St. Andrew's Square, on the evening of Monday, the 3rd inst., for the purpose of considering the fact that in consequence of an equality of votes, the council had found itself unable to carry out the wishes of the Society, as expressed at the special meeting held on the 27th ult., to the effect that the exhibitors resident in Edinburgh and members of the Society shall not be entitled to compete at the forthcoming Exhibition.

Dr. Thompson occupied the chair, and it was evident at the very beginning of the proceedings that the usual equanimity of the Society was much disturbed, and that feeling on both sides was very high.

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[*] See Report of Society on page 223.

As usual in such cases, considerable delay was caused by certain members taking their stand on trivial points of form which at other times are not thought worthy of notice; but the ground was at length cleared, and the tug of war began by Mr. Dobbie moving, seconded by Mr. Annan, that that portion of the minutes of the previous special meeting whereby residents in Edinburgh and members of the Society are precluded from competition be not approved.

Mr. W. Neilson followed with an amendment, seconded by Mr. Ross, to the effect that the council be directed to carry out the wishes of the Society as expressed in the minutes of the special meeting.

A long, stormy, and, consequently, somewhat irregular discussion followed, in which Messrs. Annan, Asher, Bashford, Douglas, Kyles, Turnbull, Ross, Tunny, Williamson, Dr. Nicol, the President, and others took part; and on a vote being taken, there voted for the amendment eleven, and for the motion twenty-four.

Talk in the Studio.

Mr. Alderman Nottage (of the Stereoscopic Company), having been appointed Sheriff of the City of London for the coming year, finds his other duties so fully absorb his time that he prefers to pay the fine and decline the office.

Paper Cockling in the Printing Frame.—A correspondent writes as follows:—"I notice an answer to a correspondent in the last copy of News with reference to preventing the cockling of paper in frames during printing, and the remedy is in direct opposition to what my own experience teaches me is the right one. In printing from line engravings that show the least want of contact I have always found the most effective way to be to put the paper on quite damp, and print in a cool place; and in no other way can I get perfectly flat prints. No amount of packing or pressure has been sufficient in my own practice to produce perfect contact with the negative if the paper is dry." If our correspondent places the paper in the frame damp, and takes care to keep it at such a temperature that it does not dry at all, he will avoid cockling; but if the paper dry at all during the process of printing, or if some parts be damp and some dry on putting it in the frame, cockling is inevitable. With a good thick piece of elastic felt, and sufficient pressure at the back of the frame, there should be no cockling, with the paper dry and flat when put in.

Fire Caused by a Lens.—More than once we have had to record serious fires caused by the accidental action of a lens in concentrating the sun's rays, and acting as a burning glass. A correspondent of the *Scientific American* says:—"A singular instance of spontaneous ignition took place in my house some time ago. On entering the house, about noon, I detected the smell of something burning. An immediate search was made, and, upon entering the parlour, I noticed smoke rising from a centre table that was placed near a south window. I stepped up to the table, and noticed some pieces of cotton goods on fire, which I smothered out with my hand. Alongside of the goods that were on fire lay a stereoscopic instrument that was exposed to the direct rays of the hot noonday sun. It so happened that such was the position of the two lenses that they caused a burning focus on the goods and set it on fire. Had we been absent till an hour later, the fire would have extended itself to the destruction of the house and all that was in it." The Editor adds:—"Accidental fires, produced by lenses, have frequently come to our notice. The glass globes filled with water, and used to contain gold fish, will converge the sun's rays to a focus of sufficient intensity to ignite light materials, and have thus started incipient conflagrations. The heavy glass bulls-eyes sometimes used for dead lights in ships have also produced similar effects; and we once called attention to a remarkable case where a bulb of glass, formed in a large sheet used as a window pane in a store, and due to a defect in the manufacture, proved the means of setting fire to objects displayed inside. Druggists' show globes of coloured water also form powerful lenses, and we once knew of an enterprising apothecary who employed them as a cheap source of heat for his distilling apparatus"

New Engraving Process.—Messrs. Leitch and Co., it is said, are now successfully practising a new process, which has not hitherto been carried on here. The drawing is done on glass, covered with a thin etching ground, which is of a pale green colour, and so thin that it can be removed with the finest etching point, and thus allowing of the most delicate lines being drawn. By placing a sheet of black paper underneath, the artist can perceive at once the progress and effect of his work, the lines of which appear in their natural black. This plate, when finished, is treated as a negative, and a photograph obtained from it, say on zinc, from which a surface-block is got in the ordinary way. The great advantage is, the possibility of seeing how the work proceeds, for in several processes this cannot be done, and the artist finds, when he has finished his drawing, that it looks very different to what he expected or intended.

To Correspondents.

J. Walker.—The simplest mode of producing paper negatives is that we described in our Year-Book a few years ago, and which has since been independently worked out with great skill by Mr. Blanchard. You will find full details in our last Year-Book, page 31. This method, however, involves the possession of a glass negative; from this a transparency is produced, and from the transparency a negative. If you wish to produce a negative on paper without the aid of a glass negative, then the calotype process will answer well. If however, you are not familiar with paper negative processes, it seems a pity to spend time in learning to work such a process successfully, merely for the purpose you name. The sensitive negative tissue of Herr Warnerke will, probably, answer your purpose satisfactorily.

R. L.—Your question is one to which a definite answer cannot well be given. Theoretically, the focus in the centre of a perfect lens is a sharp point on one plane only. The maker to whom you refer found, however, that for pictorial purposes in photography, such a theoretically perfect lens was unsuited, and adopted a plan of giving as much depth of focus as was compatible with good definition. How much depth of focus any special lens may possess without sacrificing other qualities we cannot possibly say. There is no reason, however, why a second-hand one should be worse than a new one, and the maker will verify a second-hand one if taken to him, and will state if it be genuine and in good condition. Letters reaching us after Wednesday are not in time for an answer the same week.

G. V. M.—The yellow spots of which you send examples are very perplexing, the more so that similar results may proceed from various causes. In all cases the spot is the result of a sulphur compound; but various causes will bring the defect about. In some cases it is doubtless due to defects in the paper. In some cases we have known such spots arise in paper after being kept a few months in a damp place, having been when fresh perfectly free from any such tendency. Sometimes similar spots are caused by small air-bells being formed on the surface of the print during fixation. The result is a minute spot imperfectly fixed, and this kind rarely show until after the print is brought into the light after fixation. Sometimesthe yellow spot appears during washing, sometimes not untilafter the print is mounted. The spot of imperfect fixation contains insoluble hyposulphite of silver, and this decomposes under the combined action of light and moisture, nd produces yellow discolouration. The addition of warm water to hypo is not injurious.

Fitzroy Johnston.—You will find a formula in a letter in our present issue. 2. If a picture have been suffered to dry on a ferrotype plate, the plate cannot be used with advantage again. 3. There is no rule. Its addition is still the subject of experiment and discussion. At present each operator must try, and decide for himself.

J. L.—The mounting material to which you refer is prepared as follows:—Take half an ounce of good glue or gelatine; soak in water until it has taken up as much water as it will; pour off all water but two drachms; place on the fire and melt, then add, a few drops at time, six ounces of spirits of wine, stirring till thoroughly mixed. Keep in a bottle, which must be immersed in warm water when wanted for use. You will find full instructions on page 146 of our 14th volume.

Wm. Buckley.—Thanks. The holder received, and shall have our attention.

R. F.—The gentlemen to whom you refer develops with a simple iron developer containing 15 grains of the iron salt—that is, protosulphate of iron—and 15 minims of glacial acetic acid to an ounce of water. Such a developer is most commonly used for ordinary portrait work amongst successful portraitists. Many of the organic additions proposed doubtless have advantages, and are worth trying. As a rule, a weak developer acts slowly, and produces an image with greater contrasts than a strong developer, and the addition of organic restrainers has an effect very similar to a weak developer. At one time a 5-grain iron solution was recommended as a panacea for almost every evil in producing negatives; but it soon passed out of vogue.

Several correspondents in our next.

The Photographic News, July 14, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Bichromated Glue for Mending Glass and Earthenware—Cheap Walnut Wood—Unmounted Photographs for Sale.

Bichromated Glue for Mending Glass and Earthenware.—The uses to which bichromated glue, or chrome glue, as it is sometimes called, may be put were treated of a few years back by Mr. Baden Pritchard in our Year-Book. Gradually the useful qualities of the material are becoming known, and the other day *Dingler's Polytechnisches Journal* once more called attention to them. For mending glass utensils and earthenware, glue mixed with bichromate of potash seems to be particularly suitable, for any fracture is firmly mended by means of the compound. A strong solution of glue or gelatine is made—the latter is employed when the work is to be done neatly—by dissolving five to ten parts of dry gelatine in water, and for every five parts of gelatine employed one part of bichromate of potash is added. The mixture is kept from the light till required for use, and the two surfaces of a fracture are coated with it, and then pressed or fastened together with a string. Placed in the sunshine, the bichromated glue soon becomes hard and insoluble, and after a few hours the broken object is found to be firmly cemented. If the work is done neatly, the crack is scarcely to be seen, and even hot water will fail to dissolve the glue, which has, of course, been fixed by the light. Chrome glue may also be used to prepare waterproof articles, the material being stretched, and coated two or three times with the solution, and exposed to light. To waterproof portmanteaus and bags in this manner would be a most economical proceeding, but we think the proposal to add a small percentage of glycerine to the gelatine mentioned in our Year-Book should be attended to, as otherwise the covering would be a very brittle one. The *Journal* also recommends its employment for roofing purposes, to fix the tar and add to its waterproofing qualities, and it states that a winter's rain upon a roof treated in such a way had not any injurious effects. There can be no doubt that many capital applications might be made of the material, especially by photographers, who understand the qualities of the mixture so well. Some time ago, we believe, a patent was taken out for coating the walls of apartments with the composition to render them waterproof, but we do not know whether it still stands.

Cheap Walnut Wood.—An easy way of giving light wood the appearance of walnut has lately been suggested by M. C. H. Viedt, who employs for the purpose the manganates and permanganates of alkalies. These, it is said, are capable of imparting to a pine or deal surface a beautiful walnut colour, and as many photographers will like to know how they can frame photographs cheaply in dark wood, we propose to quote M. Viedt's mode of proceeding. He takes equal parts by weight of manganate of soda and crystallised sulphate of magnesia, and these are dissolved in twenty to thirty parts of water at 50° C. This mixture it is that is applied to the wood, which rapidly assumes a very deep brown colour, if only a little water is used. The hotter the solution, the more deeply, we are told, will the colour penetrate. The colour is allowed to dry upon the wood, and, if it is thought necessary, a second application is made; afterwards the wood is treated with oil and polished. Before oiling, however, the wood is washed with hot water, so as to prevent any decomposition of Glauber salt formed by the reaction; but this operation must be carried out with care, so that the wood does not warp or split. This is the whole process, and as the colour penetrates very deeply, it affords a better imitation than many other plans of staining wood that are in use.

Unmounted Photographs for Sale.—Already we have mentioned the advantages of buying and selling photographs unmounted, and we are glad to see that the custom is to be met with extensively in Paris now-a-days. In London, except in the very cheap form of photographic scraps, it is rare to meet with unmounted pictures; but in Scotland, in the Lake district, and other places resorted to by tourists, photographs in this form are not unfrequently seen on sale. When mounted, unless they are of carte or cabinet size, pictures are of little use to a purchaser, for they are hardly worth framing, and they soon get dirty if left about unprotected. Unmounted, however, you may do with them anything you like. You may mount them either for insertion in your album or for framing, or, what is more convenient still, they may be pasted into a scrap-book. It may be a prejudice on our part, but when looking through a portrait album, especially one containing cartes, there is nothing to our mind so uninteresting as to find a lot of the pages filled up with tiny views. These are quite out of place in a family album, while the pictures are all so small as to possess but very little interest. On the other hand, these little views fill up the corners of a scrap album very nicely; and to those who make a collection of landscape photographs there is nothing so handy as one of these volumes. But then the photographs must come to hand unmounted, for not only do pictures suffer by being separated from their cards, but they are also more expensive to buy, by reason of the extra labour and material thrown away upon them. Purchasers, therefore, would often prefer to have their photographs unmounted, while those who produce them would also be gainers. The latter can sell unmounted photographs far cheaper, and make more profit upon them than upon mounted pictures; and, moreover, the loss is not so great, seeing that none of the prints are spoilt in the mounting, or by the mounts becoming soiled and injured after a time.

NEGATIVE BATH, PRINTING BATH, AND TONING BATH.

BY R. KNOWLTON.*

Having for many years, as a constant reader of the journals, interested myself with great profit in the proceedings of your society, I take the liberty of offering, at this time, for your consideration a short account of my experience in the management of some of the chemicals used in our practice. I will first speak about the bath. Some years ago I read an article on the use of cyanide of potassium for renovating the bath. I tried it with perfect success. Some little time afterward I used it again, resulting in a glorious fog, and I abandoned the cure. I notice Mr. Sherman's article on the treatment of the bath, and see that he used acetic acid, but does not tell why. I now remember that when I made my first trial with the cyanide of potassium, the bath was acidulated with glacial acetic acid, and that perhaps was the reason why the result was so satisfactory. Mr. Sherman in his practice adds cyanide as long as the bath will take it up, then adding acetic acid in certain quantities, and I infer that the action that takes place is something as follows:—The cyanide being decomposed and hydrocyanic acid formed, which again combines and forms a new compound, which is a precipitate (perhaps) of silver, and here, in my judgment, is where the great benefit lies. I am aware that a new compound is formed, and the bath becomes very temperate, taking up very sparingly of alcohol, iodides, or bromides. I put nothing of this nature in my bath and get along without trouble, not knowing that my bath contained any iodide of silver, only as I read about it in the journals and text-books. Here is my way of renovating my bath:—I use not exceeding one grain of cyanide of potassium to each ounce of the nitrate silver crystals, and only enough acetic acid to decompose it. I use bicarb. soda and liq. ammonia equal parts, to neutralize the acid.* I then place the solution in the sun until it precipitates; filter, and further sun until it filters perfectly clear. Add a little dilute nitric acid—not too much; it will show fog if you get in an excess. For albumenizing my plates, I take the white of one egg, and put it in a five-pint bottle, add one pint pure soft water, thirty-two grains iodide of potassium, sixteen grains bromide of potassium, and a handful of broken bits of glass; shake until the albumen is thoroughly cut into a froth, then add half an ounce of chloroform, and three-quarters of an ounce of liq. ammonia; fill up the bottle with soft water, shake thoroughly, and filter before using. It has been held that the ammonia dissolved, while the chloroform coagulated, the albumen. This led me to use them both, as one counteracts the other, and keeps the albumen in a normal condition, at the same time preserving it for any length of time. I prepare my silver solution for printing in the following manner:—Nitrate of silver (crystallized) forty grains, water one ounce; test with litmus paper; if acid, add liquid ammonia until you have a slight alkaline reaction. Add two grains of alum to each ounce of solution, filter and use. I float from two to three minutes, according to temperature and circumstances; fume ten to fifteen minutes. I presume you will not approve my treatment of the prints, but will give you my method and ask a verdict. I first prepare a solution in the following proportions:—Water sixteen ounces, acetic acid, No. 8, half a drachm (I guess at it). I put my prints in this solution, leaving them until they turn a mahogany-red colour, then put them into fresh water, and leave until the toning bath is ready.

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* Read before the Chicago Photographic Association.

Toning Bath.—Dissolve fifteen grains Anthony's chloride of gold in sixteen ounces of water; this I call No. 1. For No. 2 I take sixteen ounces of water, one ounce acetate of soda, and half an ounce chlorate of potassa. For every sheet of paper I use five drachms of solution No. 1, and add same amount of No. 2. I then add enough of my old toning bath to make the solution eight or ten ounces, putting in a piece of blue litmus paper, and adding bicarbonate of soda until it shows a decided alkaline reaction. I now put in my prints without any further washing. They tone very quickly. Wash thoroughly and fix in bath; seventy grains of hypo soda to twelve ounces of water. After dissolving the soda, I test with litmus paper, and if acid, neutralize with bicarbonate of soda and liq. ammonia, after which add two grains of alum to each fluid ounce; this in my hands preventing the blistering of the prints. I use this soda solution several times, and my prints fix in about twenty minutes. From the fixing bath I wash in three changes of water, then put the prints in a bath made of sugar of lead twenty grains, water one pint; leave prints in fifteen minutes. I use this lead solution over and over, occasionally adding a little lead to keep up the strength. Wash thoroughly.

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A LECTURE ON LENSES.

BY JOSEPH ZENTMAYER.†

The general properties of lenses, which are of importance, are: first, the principal axis; second, the optical centre; third, the principal and conjugated foci; and fourth, the nodal points or conjugated centres. A straight line, drawn through the centres of curvature of the spherical surfaces of a lens, is the principal axis of the lens; if the one surface is plane, the axis passes through the centre of curvature of the spherical side, and is perpendicular to the plane surface. In all lenses the principal axis must go through the middle of the lens, that is, in the concave through the thinnest, and in the convex through the thickest part; otherwise, we have a prism with spherical surfaces, and not a lens.

Every lens possesses a point, situated in its principal axis, which is of great importance. Rays of light, passing through that point, will undergo equal opposite refraction, so that it will leave the lens parallel with the direction in which it entered. If we consider the lens without thickness, we simply say, rays passing through the optical centre of a lens undergo no refraction. The optical centre can readily be found by drawing two radii, A B and C D (Fig. 6), from the centres of A C′ of its surface, parallel to each other, but oblique to the axis A C, then connect the two extremes B and D, and the line B D or its prolongation will cut the principal axis in O, the optical centre. If the lens is a double convex one of equal radii, the optical centre is the centre of the lens, or its centre of gravity. Fig. 6 is such a lens. Now suppose we change one curve into a shallower one, of longer radius, it is evident that the optical centre is shifted towards the predominant, more curved side, and if we continue to make that side shallower, it will gradually move towards E, until the surface is converted into a plane, in which case the optical centre is coincident with the point where the axis cuts the curved surface E. This, we will see afterwards, is an important point. But let us go on in the same way, still reducing that surface by making it a concave or negative one; it is clear that the optical centre still marches on, moving out of the lens, and if we go on so far as to make the negative curve equal to the positive one, then the optical centre would be in infinity, and if we disregard the thickness, we have no lens, but a non-optical glass like a watch-glass. All straight lines passing through the optical centre of a lens are called secondary axes. The next and most important of the general properties of a lens is their principal focus and the conjugated foci. If we hold a convex lens towards the sun, and a sheet of paper at a certain distance behind it, we observe a bright little circle, in which the sunlight falling upon the lens is collected; the point where the circle is smallest, and therefore most intensely illuminated, is called the principal focus; that is, the focus for parallel rays.

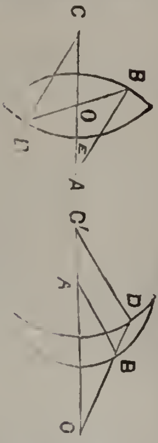

Fig. 6.

If we have to calculate the area of a circle, we are bound to look at the circle as a polygon of an infinite number of sides, and we will do well to take the lens as an infinite number of prisms, more so, as the infinitely small portion of the lens, struck by the ray, may be taken for a tangent plane. Thus a converging lens may be considered as prisms united at their bases, and a diverging lens of prisms united at their apices. As we already know that prisms refract parallel rays towards the base, it is easily seen why converging lenses refract the rays R R (Fig. 7) to *f*, and that diverging lenses diverge the rays R R to *f′*.

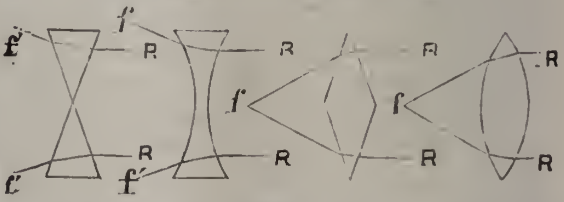

Fig. 7.

The distance of the focus from the lens depends, 1st, upon the curvature; 2nd, upon the refracting power of the material; and 3rd, upon the thickness of the lens.

Not to make the matter unnecessarily complicated, we will take the supposition that our lenses have an extremely small, or no thickness at all. For common glass of an index of refraction of 1·5, calculation shows that a plano-convex lens has a focal length of the diameter of the sphere of which the lens is a part. A double convex lens of equal radii has its focus half that distance, or equal to the radius of the surfaces. If the double convex lens of equal radii, say of 10 inches, is made of the following substances, the thickness neglected, the foci would be,

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* This treatment will leave acetate of silver in the bath, a dangerous element in a negative bath.—Ed. Photographic News.

† Continued from page 316.

For common glass, index of ref. 1·5 = focus 10 inches.
,, flint ,, ,, ,, 1·6 = ,, 8·33 ,,
,, diamond ,, ,, ,, 2·439 = ,, 3·48 ,,

We see that the diamond lens of the same radius has a focal length of little over ⅓ of the crown glass lens.

We have now seen that luminous rays from a point infinitely distant are collected to a single point in the axis, the principal focus. But let us suppose we move the luminous point towards the lens to make the rays perceptibly converging; then, the lens, which was strong enough to bring parallel rays to the point where the principal focus is situated, is not strong enough to bring these diverging rays to the same point, but they will cross the axis at a point farther removed from the lens; and as the radiating, luminous point is moved nearer to the lens, the farther off from the lens they will cross the axis; by moving still on, we came to a point where the radiating point and the point where the rays cross the axis on the opposite side, are equally distant from the lens. In this case, the radiating point and the rays where they cross the axis are nearly four times the distance of the principal focus apart. For ordinary purposes, this affords a ready means to determine the principal focus of a lens. But let us move on still nearer to the lens, and the focus on the other side will continue to move farther away, until we reach the principal focus this side; then the rays will emerge parallel on the other side. By over-stepping that point, the rays will emerge diverging. These variable distances of the luminous point and the focus on the other side are called the conjugated foci. There remains to be mentioned another important general property of lenses, the nodal points, or, as they are sometimes called, the centres of admission and emission.

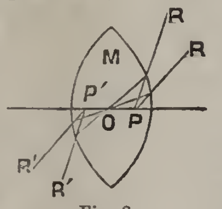

Fig. 8.

M is a double convex lens of equal radii, O is its optical centre. Any ray passing through the optical centre, as R R, emerges on the other side parallel to its first direction, R′ R′, as explained before. If we now prolong R and R in their first direction, they will meet at a point P, the one nodal point, or the centre of admission, and if the emerging rays are also prolonged, they will converge to a point P, the other nodal point, or the centre of emission. We recollect that in the pin-hole camera the size of the image compared with that of the object is exactly in the same proportion as the distance of the screen to the hole is to the distance of the object from the hole. These distances represent the two conjugated foci, as there is no deviation of the rays from a straight line, and the two triangles, which are to be compared, meet with their apices. But if we have a bi-convex lens (Fig. 9) and A B an object, C D its image, it is clear that the conjugated foci are to be measured from the nodal points P and P, and the two conjugated foci are F P and F P, showing how erroneous it is to measure the foci either from the surface of the lens, or from the optical centre. In a Meniscus, the one nodal point is situated outside of the lens, and the other one inside of the lens. But in a plano-convex lens the optical centre, as well as the nodal point, is situated where the principal axis crosses the curved side. The plano-convex lens is therefore the only lens of which the focal length can be measured directly. If the plane side is placed towards a very distant object the distance of the curved side to the image is the principal focus.

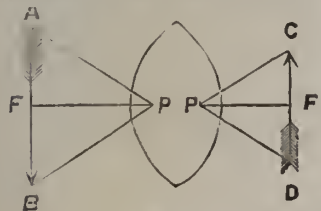

Fig. 9.

It is often necessary to know the focal length of a lens or a combination of lenses, especially in photography; but if no plano-convex lens of known focal length is at hand, for the purpose of comparing the size of the image, the following way may be adopted: first, focus the lens for a very distant object, on a screen, and mark the position of the screen. Do not move the lens, but place a bright object, about twice the focus of the lens, in front of it as near as you can suppose; now move the screen about the same distance from the lens as the object was placed, and focus thereupon. If you find the object and image not of exactly the same size, move object and screen accordingly, and focus sharp, until the object and image are precisely of the same size; mark the position of the screen again, and the distance of the first and second mark is the focal length of the lens, or the equivalent lens of a combination of lenses.

We are now acquainted with the most important properties of a lens, and it remains only to be said that all combinations of lenses have precisely the same general properties as single lenses.

(*To be Continued.*)

TEMPERED GLASS.*

The percentage of breakages depends upon the degree of care exercised and skill possessed by the workman; it is stated to be somewhat less than in the ordinary manufacture, and even that percentage is being reduced as time goes on and men get accustomed to the process, as experience has shown. In America the breakage was large at first, but after six months of working it has greatly diminished. The cost of production is very small, the advantageous results obtained in durability being quite out of proportion to the outlay. Moreover, the application of glass is now being extended to the production of articles for which its use was previously impossible. What the precise economy is over the ordinary process of annealing it is scarcely possible to say at the present early stage of the new process of tempering. We are assured, however, that there is a saving, and it will doubtless increase as time proceeds and the development of the process extends. There is one description of goods which has hitherto remained outside the pale of M. de la Bastie's process, and that is glass bottles. Owing to certain peculiarities in their construction, they have previously presented difficulties in the way of tempering. That question has of late received M. de la Bastie's attention, and by means of an ingenious device, which, at a future time, we shall be permitted to describe, he has overcome the difficulty, and bottles and decanters are now being made at Choisy in the ordinary course of manufacture, as was witnessed by us on the occasion of our visit.

The main conditions for successfully carrying out the tempering process are four in number. In the first place, it is desirable that there should be an equal thickness, or nearly so, of glass in the article under treatment, in order that expansion and contraction may go on evenly throughout the whole mass. In the second there should be an equal diffusion of heat throughout the glass, at the highest temperature which can be attained without disturbing the shape of the article. The third condition relates to the way in which, and the angle at which, the article should be plunged into the path. The angle found best for some articles is that of 45 degrees, while for others the vertical position is necessary, and in each case a tap is given to the pontil in order to detach the article; but even with these conditions properly observed it is incomplete without the dexterous manipulation of a handy workman. The fourth, and last, condition is that of absolute purity in the bath and the absence of all moisture, the least presence of which causes the glass to break when dropped in the bath. To ensure perfect freedom from every atom of water the fatty compounds are boiled for several days before they are allowed to be used in the bath. The nature of the ingredients of the bath, too, has an influence upon the results of the process, and the components have to be varied according to the nature of the objects to be treated. They, however, consist generally of oily and fatty matters. With all these conditions properly observed, the result is the production of glass articles which, if not absolutely unbreakable, are, at any rate, capable of resisting a series of violent blows. While at Choisy a number of glass articles were fired at with a saloon rifle. Notably a thin champagne tumbler, three inches high and two inches in diameter, was fired at and hit eleven times in succession without being broken. At the twelfth shot, however, it yielded, and was reduced to hundreds of small crystals—a condition which properly tempered glass always assumes when broken. It is right, however, to state that other specimens yielded much more quickly, but the test was a severe one.

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* Continued from page 317.

Besides the works at Choisy le Roi, M. de la Bastie still keeps his experimental works at Pont d'Ain in operation. There, however, the glass is purchased from makers and re-heated and tempered. At Pont d'Ain there are in all eleven furnaces, two single and two double for tempering plate-glass, and five for other kinds of glass. There are, also, some smaller furnaces for tempering watch-glasses. The plates of glass at present tempered are of various sizes, the largest measuring eighteen inches by twelve inches; large sizes will, however, soon be tempered, and new machinery is in course of construction for that purpose. It is also intended to put up two furnaces at Pont d'Ain for the manufacture of tempered glass in the same way as at Choisy. Besides the two factories of M. de la Bastie there are three others in France at which his process of tempering has been adopted. These are the extensive glass factories of Lyons, Vierzon, and Aubervilliers, near Paris. At these works M. de la Bastie has such orders executed as he receives and which he is unable to execute, owing to the present comparatively limited capacity of his own establishments. These are subsidiary arrangements to which we alluded when referring to the necessity for extending the works at Choisy. The proprietors of twelve other works in France are now in communication with M. de la Bastie, with the view of adopting the manufacture of tempered glass upon his principle.

The tempering process has also been introduced into several countries besides that which gave birth to its inventor. In Germany, for example, there are a number of works at which tempered glass is being made. In America, also, it has taken good root, the agent there being Mr. H. S. Almy, of Murray Street, New York. The process has been six months at work in Brooklyn, and has been adopted at works in Pittsburg and Boston, and at the Bellaire works and the Wheeling Works, in Ohio, as well as at other works in smaller cities.

In England the tempering process of M. de la Bastie has not made such progress as in any other country in which it has been introduced. It may be that British manufacturers, with their usual cautiousness, are waiting to see the process commercially developed in other countries before venturing on the enterprise themselves, or, in other words, they are, as a rule, desirous of availing themselves of the experiences of others without risk to themselves. There are, however, two exceptions to this rule, and these are the firms of Messrs. James Powell and Sons, of Whitefriars, and Messrs. Pellatt and Co., of Blackfriars, both well-known glass manufacturers, and M. de la Bastie's English agents, Messrs. Abel Rey and Brothers, of 29, Mincing-lane, who are taking active measures for extending the working of the process in England. From the first Messrs. Powell have taken an interest in the invention, and some of their earliest products were exhibited in part illustration of a paper on the subject, read by Mr. P. F. Nursey before the Society of Arts in June last year. At both of the above works the De la Bastie process is now carried on as well as the ordinary manufacture of flint glass, and through the courtesy of the proprietors we have recently had an opportunity of inspecting the manufacture at both places. At Messrs. Powell's the bath is placed near the furnace, and the glass articles, as made, are dropped into it from the pontil. The bath is fitted with a wire basket, as at Choisy le Roi, and when a number of articles have been made, they are taken out, stood to drain and cool near the furnace, and afterwards cleaned with fine ashes. Messrs. Powell do not adopt any of the subsequent operations in use at Choisy after the bath, their opinion being that the tempering is complete as soon as the glass article has come in contact with the heated fat. At the time of our visit finger glasses, plain and moulded, were being made. The process, however, is only worked occasionally, and as the cessation of pressure in the manufacture of ordinary glass permits.

At Messrs. Pellatt's works the bath is not only fitted with a large wire basket, as in the former cases, but with a smaller one, having a vertical division and a false bottom of wire gauze to each compartment. The object of this arrangement is that each glass article may fall on the soft wire gauze, instead of on to the glass articles beneath before the tempering had proceeded sufficiently far to prevent accidental breakage. The glass article is dropped from the pontil into one of the compartments, and remains there until another article is ready to take its place, when the false bottom is lowered and the glass falls to the bottom of the large basket. This arrangement was formerly in use at Choisy le Roi, but as the manipulation improved, it was found to be unnecessary, and so it was abandoned. When the large basket is sufficiently full the articles are taken out, drained, and are finally cleaned with sawdust. At Messrs. Pellatt's works some interesting experiments were made with tempered glass. Ice was placed inside several tumblers, and they were floated in a vessel of boiling water until the ice had melted, no breakage whatever resulting. Conversely tumblers were surrounded by ice, and boiling water was poured into them with a similar result. It will be observed that at neither of the English works is the glass drained in a hot room, or placed in two subsequent baths of alkalis and of hot water, as at Choisy le Roi. Altogether, the process is much less elaborated than at M. de la Bastie's works, the English makers not deeming the arrangements carried out at Choisy necessary.

Before concluding our notice of this most interesting manufacture, we may observe that the reputation of tempered glass has suffered somewhat at the hands of some unthinking persons—and is very likely so to suffer again—because it is not indestructible. Because a tempered glass article can be thrown about a dozen or twenty times without being broken, it is expected that it should not break at the thirteenth or twenty-first fall; or, in fact, not at all. If, however, a tempered glass is not broken until it has had twelve or twenty falls or blows, any one of which would have smashed an ordinary glass, it is evident that a great triumph has been achieved. The article is now fairly on its trial before the public, and, with fair play in manufacture and in use, will doubtless prove of great value, not only for the purposes to which glass is ordinarily applied, but in other and hitherto unhoped-for directions.

NOTES ON THE SENSITIVENESS OF SILVER BROMIDE TO THE GREEN RAYS AS MODIFIED BY THE PRESENCE OF OTHER SUBSTANCES.

BY M. CAREY LEA.*

SEVERAL investigations made at different times during the past years on the sensitiveness of silver bromide to rays of different refrangibilities led me to the conclusion—1st. that its sensitiveness to the different rays could be distinctly modified (increased or diminished) by the presence of various bodies, coloured and colourless; 2nd, that no relation could be traced between the colour of the modifying body and the refrangibilities of the rays to which the sensitiveness was modified. During the past winter I have carefully re-examined the question, which is an important one both in its theoretical and practical relations, and have found my conclusions in all respects confirmed: and I have, during the past winter, been occupied with a single portion of the subject, namely, the action of the green rays, as a special study.

In this investigation I have pursued the same general method as before; that is, I have used coloured glass whose transmitted rays have been carefully studied with the spectroscope. There is no doubt in my mind that this method of examination is capable of giving results as valuable as those obtained by the use of the spectrum. It may be said, in fact, that the subject requires for its full elucidation the use of both methods. To those who may imagine that the results of the exposure to the spectrum are the more reliable, it may be interesting to have specified the weak points of that method.

The relative strength of the impression produced by different portions of the solar spectrum on a sensitive surface will always depend upon the intensity of the light employed and the length of exposure. It has already been proved that silver iodide and bromide are sensitive to every part of the spectrum. It follows that any and every part of the spectrum may be photographed upon plain iodide or bromide if only the exposure be sufficiently prolonged. The longer the exposure the stronger will be the impression produced by the less as compared with the more refrangible rays. Also, it is known that, by a system of masking, Professor John Draper has succeeded in photographing the whole spectrum at once; that is to say, he was able to hold back the action of the more refrangible rays until that of the less was sufficiently strong. The masking was of course done with red or yellow media. Now, when pigments of these colours are extended over sensitive films, what is this but a sort of masking, which retards the action of the more refrangible rays while freely permitting that of the less? Even supposing these pigments to be chemically inert they would check the action of the blue end of the spectrum, and render it possible by a longer exposure to obtain both together. Even a longer exposure would not be absolutely essential; a more powerful or a longer development may take its place, being rendered possible by the diminished impression of the blue end.

If, then, it is alleged that by colouring a film of silver bromide with red pigments the sensitiveness to yellow rays is increased, we are at once moved to reply that such a result is no proof of a chemical or photo-chemical action exerted by the red pigment; that precisely the same result might be expected if the red substance were chemically inert, or if it were extended over a glass surface and simply interposed in the path of the rays, between the prism and the film, without even coming into contact with the latter. Many results that have been published are liable to this fatal objection. It has been proposed to modify the form of experiment by applying the colour to the front of the plate and exposing on the back through the glass; but even this does not remove the difficulty. The collodion film containing the silver bromide is exceedingly thin, and when moistened very porous and absorbent. Any soluble colour applied, dissolved in water or alcohol, instantly penetrates it through and through, and even moistens the glass under it; and all the colours mentioned by other experimentalists as having been subjected to this experiment are soluble. It is on these results that theories have been based, and they are all susceptible of full and complete explanation in the manner just mentioned.

In matters of photographic experiment, such as these now under discussion, there are always three distinct factors—the sensitiveness of the matter, the force of the impression (depending upon the intensity of the light and the length of exposure), and the development. This makes the investigation difficult and deceptive. If we take two identical sensitive films and submit them to the same exposure, we may get quite different results by varying the development, or with an identical film and development by varying the exposure. The amount of error and deception liable to be introduced in this way is known to none but those made familiar with it by experience, and, consequently, for accurate results these sources of error must be eliminated. There is but one way of doing this:—A film must be taken, one portion of which must be washed over with the substance whose action is to be studied, and then the two portions—the plain and that which has been treated—must be simultaneously exposed and simultaneously developed. Both portions must receive the same rays of equal intensity and for an equal time; the development must be made by a bath applied to both portions equally and for an equal time. If these conditions be not maintained the result will be deceptive. The intensity of light must be the same and the duration of exposure, because the relative effect of the different rays will always be proportionate to them. The same plate exposed to the same image for a double time, or for an equal time to an image of double intensity, will give a final result in which the relative strengths are totally different. The relative strength of different parts of the image is also largely modified by the development. I am, therefore, justified in affirming that no strictly comparative trial can be made except the two images on the coloured and uncoloured films be received on the same plate simultaneously and for the same time, and be simultaneously and equally developed.

These conditions have never yet been fulfilled in the case of spectral observations. By the use of coloured glass they may be maintained with absolute exactness; and when coloured media can be obtained which exclude all but a given band of consecutive rays the effect of coloured substances added to the film of silver bromide, in modifying its sensitiveness to this band of rays, may be accurately fixed. Having previously, with the aid of the spectroscope, determined the exact character of this band, I am enabled to speak very decisively of the action of the rays of which it is composed.

In the present investigation I have limited myself to a single question—Does there exist any red substance which is capable of increasing the sensitiveness of silver bromide to the green rays?

For the purpose of this examination I used three thicknesses of very dark green glass, the limiting wave-lengths of which had been many times measured with closely corresponding results. The widest variation was two minutes of arc, which, when it is considered how gradually the band fades out at its borders, and how very faint the illumination is at its extreme limits, is fully as close an approximation as could be expected. The extreme limits of the band, measured to the limit of visibility, were $\lambda 497$ and $\lambda 581$. But the extremities showed an illumination too feeble to have any effectual result. Cutting off the very faint light the band was reduced to $\lambda 517$ on one side and $\lambda 569$ on the other, and the rays between these limits may be taken as those whose results were observed.

(To be continued.)

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* *Silliman's Journal of Arts and Sciences.*

The Photographic News.

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ANOTHER NEW STYLE OF PORTRAITURE.

A very charming novel effect in portraiture has just been brought under our attention by Mr. Richard Brown, of Liverpool, under the title of "Mezzotint Vignettes." The effect of the portrait, although attained by an exceedingly simple and easily applied method, is singularly artistic, and suggests very high and elaborate finish; but as the means are solely photographic, no personal artistic skill is necessary to produce the result. The last statement may easily seem damaging to the method in the estimation of many, and requires, therefore, in passing, a qualification or explanation. The method itself is essentially the outcome of artistic taste, and the more artistic taste the photographer possesses the more effectively he will apply the method in question. But by stating that no artistic skill is required to produce the result, we mean that the skill of the draughtsman or colourist is not needed, skill with the pencil or the crayon being quite inapplicable here, all the operations being strictly photographic.

The especial effect presented by the portrait after treatment is that of a vignetted picture upon a rough-grained drawing-paper, in which the background and portions of the graduated drapery retain the broad, sketchy, retiring, or atmospheric effect communicated by the texture of rough drawing-paper, whilst the face and other important parts seem to have been worked upon with rare skill in black and white, to produce the smoothness of an ivory miniature, without the slightest loss of photographic texture. The portrait at the same time appears to have acquired unusual solidity and modelling, whilst the background has a soft, filmy, retiring effect, most important in giving value to the figure.

The desire to secure such a result has often been manifested, and various patents have been obtained for different methods of securing something like it. The plan of printing through mediums which give a stippled or other grain to the image has been tried; rolling the finished print in contact with rough drawing paper, or with a grained plate, or with sand paper, has been tried. But in all these methods there was the disadvantage that the grain or texture was alike all over the picture, and at times produced an effect on the face suggestive of small-pox, which was decidedly objectionable. The introduction by Mr. Vanderweyde of a mechanical plan of stippling the background and retiring draperies was felt by many to be a decided improvement, and various plans of modifying and imitating it were tried. But there were two drawbacks: in the first place, although the method was mechanical, it was found that a certain manipular skill, not universally possessed, was necessary in applying the method, and further, that unless some degree of artistic taste directed the manipulations the result was at times very unsatisfactory; and in the next place the process, however skilfully applied, was inapplicable to cards and cabinets, or, in fact, to all prints which were not sent out under glass.

Mr. Brown's novelty most resembles in effect that produced by the Vanderweyde process, but with the essential difference that the actual surface texture is the same throughout the print: there is not one portion with a matt or dead surface and another with a glazed surface, as in the Vanderweyde prints. The mode of producing the effect is as follows:—A vignetted print is produced in the usual manner; after which the print is exposed for a few moments under another negative having a grain or texture, fine or rough, as may be chosen, the centre being, of course, opaque, to protect the figure. This texture is imprinted on the white margin of the print, and merges into the graduation of the vignette. The face and other important parts, being protected from the light, retain the natural texture of the photograph, whilst an effect precisely the same to the eye as that of rough drawing paper is imparted to all other parts of the prints. The result is marvellous, and admirably illustrates the effect of contrast. By comparison with the rough texture of the background the face seems suddenly to have acquired a rare degree of delicacy and tenderness, apparently due to high artistic finish.

One word, in passing, on the kind of negative required for printing in the grain or texture. The effect to be produced is of the most delicate character. Hence a thin negative, with the grain slightly indicated rather than strongly made out, is required. A piece of rough drawing paper, or a piece of morocco leather, is photographed with a side light, and a thin negative with little intensity is produced, the size of the grain being governed by the size of the pictures for which it is to be used. This thin negative prints quickly; the slight tint produced, toning greyer than the image, readily acquires the retiring, unobtrusive effect so valuable in the picture. Mr. Brown will, we believe, supply example negatives, which will be found useful to those who are not familiar with work in this direction.

Few things are more calculated to please the public than the suggestion of purity and delicacy in the skin, which in no degree interferes with absolute faithfulness in portraiture. Despite the risk of modified likeness, the public, as a rule, like retouched portraits, and that chiefly because a refined delicate texture is given to the face by the retoucher. Here an equal effect of refinement is produced with much less touching, and, therefore, much less risk of spoiling the likeness. As a means of giving a new stimulus to business—which is, we fear, with many photographers only too stagnant at present—this mode of finishing the picture should certainly be welcomed, as a novelty which has the effect of flattering the sitter is sure to be welcomed by the public; and it should be additionally welcome to photographers, as it is easy to apply, requires but little in the way of appliances, and is applicable to all old negatives. Mr. Brown has, we understand, patented the process, but has deprived such a fact of the objection it often possesses in the eyes of photographers, by charging an insignificant sum for the licence, and including tuition in the charge. We understand that the matter is in the hands of Messrs. Marion and Co., who will supply details on the commercial bearings of the matter.

OBSERVATIONS IN THE TYROL.

BY A PEDESTRIAN PHOTOGRAPHER.

You have asked me to send some notes of the little tour I am making in the Tyrol. I do not know what I can say, however, to interest your readers, for although it is true that I take a camera with me, and hope to obtain some pictures on my journey, my travelling is undertaken simply for the purposes of recreation, and nothing else; or, at any rate, any notes I take will not refer so much to photography as to matters of interest to the ordinary traveller. I hope, therefore, your readers will pardon me if I am not always talking about silver baths and dark tents, dry plates and developing solutions.

There is another cogent reason, by the way, why I should not refer to these in my letters. It is that I am not travelling with them. I am on the present occasion a photographer *de luxe.* My mountain journeys are always made with the knapsack, and when I quit this town on my journey south I shall leave behind me a package of railway wraps, books, time-tables and other non-essentials, and proceed on my way with just those things that are absolutely necessary, and that I can carry myself over a stiff mountain pass without any considerable fatigue. Ten pounds is about the weight of my knapsack, and if the reader will bear in mind that this has to be carried a day's march of thirty or forty miles (I speak, of course, of extremes), sometimes for half-a-dozen hours over a slippery glacier, and sometimes down ravines and stony descents where one's balance is easily lost, he will agree with me that I cannot afford to be weighted much further with camera and prepared plates. And yet I am provided with a 5 by 4 apparatus, and the wherewithal to take seven dozen pictures of this size, which, together with my knapsack, I hope to carry over the magnificent Oetzthal glacier in a few days.

The secret of doing this many will guess. I am provided with that wonderful little apparatus by M. Warnerke—the roller dark slide. This is a little box, an inch and a half thick, which fits into the camera where the dark slide usually goes, and this box contains a long band of sensitized tissue, which is passed from one roller to another, as you expose picture after picture. A little window fitted with yellow glass, about half-an-inch square, allows me to read certain numbers which are on the tissue at intervals of every five inches, so that when I have exposed No. 4, I set the rollers in action until No. 5 appears before me at the little window. Nothing is more simple, and apparently nothing more practical. Before setting out I made a couple of exposures at home, and to make sure that the tissue was good, and that the instrument acted properly, I opened my roller slide, and cut off the portion of the band that I had exposed. The result was two spotless little pictures which have sent me on my way in high spirits, in the hope of returning with some little sketches of the quaint Tyrolese cabins and picturesque village scenes which are among the most original and characteristic objects of European life.

One of the advantages of the roller dark slide over prepared plates I personally shall prize very highly. Hitherto, at the end of a tiring day's journey, when my companions were settling themselves comfortably to sleep, I had often an hour's work before me, changing my plates. While scarcely able to keep from closing my eyes, I have been compelled to undo the tinfoil coverings of my exposed and unexposed plates, to replenish my dark slides, and to add to my store of pictures; and this duty, although apparently a light one, had to be conducted so carefully and completely that it required a long time to perform. Under the present circumstances, I hope to dispense with any work of this kind at all, and start even with my friends in the matter of sleep, which to a pedestrian is of no little importance. I shall not develop an image till I get home.

Many may say, but how if the whole thing is a failure? I can only reply, *tant pis.* But my experience of half a-dozen exposures of the film has shown me that I can get clearer pictures than with dry plates, more free from those dust pinholes which are unfortunately so frequently met with. If I worked with wet plates I should of course be more certain of my results; but then, as I have shown, this would be simply impossible. Nothing venture, nothing win, is a very good motto to bear in mind; and by having recourse to dry processes I have been enabled annually for the past half-dozen years to secure a score or so of little sketches of Norway, the Tyrol, the Pyrenees, the Bavarian Highlands, the Low District, &c., which have served as pleasant reminiscences of my tours, if no other purpose.

I may give a hint, possibly, to some of my readers who may have occasion to travel in or across Germany. Ten years ago the return-ticket was practically unknown in this country, at any rate, so far as long journeys were concerned, but the enterprise of railway companies and excursion agents in England have led to the development of a system of touring which now eclipses any arrangement we have upon our lines. With us circular tour tickets are issued only in the tourist districts, but in Germany they are to be obtained to include any town pretty well in the great Fatherland, in Austria, and in Italy. In Hendschel, which is the German Bradshaw, there will be found set down at the end of the book a dozen closely-printed pages of circular tours embracing every conceivable journey. The changes are rung upon the towns in every possible manner. Being aware of these tours, I made a study of them before starting, and having to pass from Cologne to Munich, I searched for a tour that would take me to the capital of Bavaria and back again. This I obtained for one and a third the price of a single ticket, and having obtained it I asked permission (in order to get through my journey quickly) to go direct to my destination, instead of availing myself of a circular route, and stopping at any of the stations. My request was readily conceded, and thus I secured a return ticket on very advantageous terms.

Munich, July 2, 1876.

IMPROVED PORTABLE PHOTOGRAPHIC APPARATUS.

We find in the *Scientific American* a description of a manipulating box, which is patented in this country and abroad, which is described as intended to enable persons having little or no knowledge of photography to succeed in producing good pictures. It is said to be equally well suited for the professional artist as for the amateur, and its compact form renders it especially well adapted for out-of-door work. The manipulations required are purely mechanical, and require no dexterity or skill. The dark room or tent is abolished, and there is little probability of clothes or hands being soiled with the chemicals.

Fig. 1 represents the invention ready for use; the construction is depicted in the sections, Figs. 2 and 3. The central and main case A, Fig. 3, is provided in front with the usual lens and cap, and in rear with removable shutter shown detached at B, Fig. 1. To the bottom of the main case at each side are hinged side cases, C, which when extended as shown in Fig. 1, are sustained by cords, and when

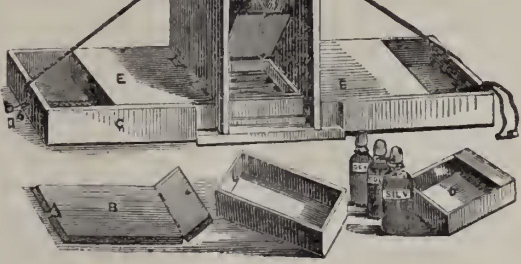


FIG. 1.

folded as in Fig. 3, are attached to the main portion by hooks and staples. Openings are made in the lower part of each side of the main casing, as shown in Fig. 3, to allow of inserting therein the trays. D, containing the developing and other solutions. Just above these openings are hinged boxes E, which enclose the trays when the latter rest on the side cases C. In this position the two boxes, with the central or main case, form the dark chamber. When the apparatus is folded, the boxes rest, as shown in Fig. 3, against the side walls of the main case. The trays D are made of sheet zinc, and are controlled from both sides of the apparatus by the strings F, by which they are drawn at will from their position in the boxes, E, into the main chamber, or *vice versa*.

FIG.2.

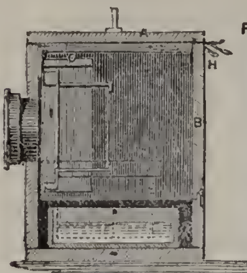
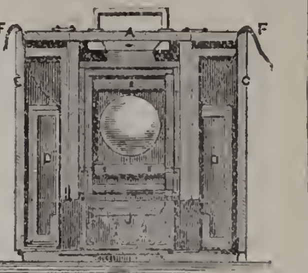


FIG.3.



G, Fig. 2, is the focussing frame, which slides by a dovetailed piece in guide strips. The sliding piece is graduated above, so as to allow of the adjustment of the frame in any position in which it has formerly been set. A loop shown at H, Figs. 1 and 2, serves to move the frame as desired. Inside the latter is pivoted a swinging frame (I, Figs. 1 and 2), which supports projecting wire arms having hook ends to hold the ground glass or sensitized plate. This frame is held above by a suitable catch, which is released at will by one of the strings shown at the top of the case. A second string serves to raise and lower the frame I, so that the plate may be dipped at will into the different solutions contained in the trap below (dotted lines, Fig. 2).

Besides the two trays in the side boxes there is an additional water tray, which is introduced into the main case through the lower hinged part of the rear shutter. There are also suitable boxes J, Fig. 3, for storing the bottles of chemicals, &c. The mode of manipulation is as follows, the apparatus being arranged as in Fig. 1:—

The focussing frame is drawn out and the ground glass inserted, and the whole pushed back until the catch engages. The frame is then adjusted until a clear sight of the object is obtained on the glass, when the figure marked on the slide piece scale is noted. One of the side trays is next drawn into the main case and filled with the silver solution from one of the bottles shown. This tray being returned to its first position, the other tray is similarly drawn forward, filled with the developing solution, and replaced. The collodionized glass plate is now inserted instead of the glass one, and the frame moved forward. The rear shutter is affixed in position. The swinging frame catch is next released; and the frame is gradually lowered into the silver solution, the tray containing which has previously been drawn into position. The plate is allowed to remain in this bath for about four minutes, to render it sensitive to light. It is then lifted out, and the frame carried forward until the click of the catch is heard. The focussing frame is now adjusted to the mark on the scale already observed, the lens cap is removed, and exposure takes place. The tray with the silver solution being returned to the box, the developing solution is drawn into position, and the glass plate is lowered into this for about ninety seconds. At the expiration of this period it is removed; and the water bath being introduced through the rear shutter, the plate is finally lowered and washed. Nothing further remains to be done but the usual finishing treatment.

CAN THE BATH BE OVER-IODIZED?—INFLUENCE OF TEMPERATURE.

BY ALFRED HALL.*

At the last meeting of the society I was asked to consider two questions, viz., "Is there such a thing as an over-iodized bath?" and "The importance of temperature; or, more properly, the influence of temperature on our chemicals." Since that time I have given them considerable thought, and feel that I can now speak understandingly. In looking back to the records, I find these subjects were suggested to the meeting by a member reading from *Anthony's Bulletin* extracts from an article by a South American correspondent, who seems to doubt there being such a thing as an over-iodized bath, and assumes that what is called over-iodizing is simply a want of silver. Now, Mr. President, I will discuss this question before touching upon that of temperature. First, I make the assertion that there is no such thing as over-iodizing a bath; neither is the effect, as assumed by the writer, produced by the want of silver. You will ask, then, what is it that causes the trouble? I can give you no better answer than to refer you to Vogel's "Hand-book of Photography," page 138. He says, "every collodion, besides the salts of iodine and bromine, contains pyroxyline, and also the organic products of decomposition. With every plate, a quantity of these, as well as alcohol and ether, is left in the bath, and after a while it will contain, besides the salts of silver, the salts of cadmium, alcohol and ether, the organic products of decomposition from the collodion and iodide of silver, and acetic acid, formed by the oxidation of the alcohol." He says, "no wonder, then, that it changes rapidly; that it soon ceases to yield strong and vigorous plates, and furnishes weak negatives instead." In my opinion, this covers the whole ground, but he says, in addition to this: "Finally a point is reached where the iodide of silver which has collected in the bath collects on the plates and gives rise to pinholes." This I believe to be an absurdity, for it is well known that iodide of silver is heavy, and what is not dissolved by the bath would naturally fall to the bottom. Notwithstanding the above information, the author tells us on page 106 that to prevent a newly-made bath from dissolving the iodide formed on the plate, to leave a coated plate in it over night; or what is better, he says, is to add at once a salt of iodine, which causes the formation of iodide of silver, and lessens the capacity of the bath to dissolve it out of the film. Now, Mr. President, these instructions followed will carry into the bath one of the mischievous elements the author enumerates above, viz., the salts of potassium or cadmium, as the case may be, which the dipping of every plate adds to. The above direction I look upon as one of the absurdities which has crept into a very excellent work. I notice that authors differ in their instructions how to iodize a bath. Lea instructs us to put iodide of potassium in the bath, but Hardwick, who is acknowledged to be the best author on photographic chemistry, directs us to use iodide of silver. In my earlier practice I always used iodide of silver—made it and used it in the same way that Anderson instructs us in his "Skylight and Dark Room" (see p. 129). Iodide of silver is so heavy that it sinks in water about as readily as so much sand, but nitrate of silver possesses the power of dissolving a certain amount of iodide, thus the necessity of iodizing the bath to keep it from dissolving it out of the film, and if the bath is anything short of saturation it will most assuredly attack the iodide as it forms in the film, thereby producing a thin bluish coating. Anderson insists that a bath becomes over-iodized, and tells us how it becomes so. He says, for instance, suppose we take four ounces of a solution of nitrate of silver, at forty grains to the ounce; next, we dissolve five or six grains of any iodide, such as ammonium or potassium, in water, and add this to the silver solution. Immediately a dense yellowish white precipitate is formed, namely, the iodide of silver. The solution may then be shaken, when it will assume a milky appearance, and some of the surplus iodide will fall to the bottom. The solution is now said to be over-iodized; that is, it contains more iodide than it is capable of dissolving. Next filter the solution perfectly clear, the surplus iodide remaining behind on the filter. The solution is now said to be saturated; that is, it contains as much as possible, which is of course true, and according to his own statement (see page 133, Anderson), is in just the condition a bath must be in to produce the best effects. He says, "As the bath approaches the state of saturation by the repeated dipping of plates," of course it is not essential how it approaches saturation, "the best chemical effects are undoubtedly produced from the simple fact that the film is less and less interfered with, the saturation of the solution preventing its attacking the film." So you see, by his own statements, a bath must be saturated to produce the best results, and also by the author's own statements, what he calls over-iodizing is simply the mechanical presence of iodide, which, in a state of rest, readily falls to the bottom, and cannot do any more harm than so much fine glass, unless it is stirred up, when it would immediately produce milkiness—and who would be stupid enough to work his bath in that condition, when the simple process of filtering would leave the surplus iodide in the filter, thus setting the bath right? In my opinion the only way to properly iodize a bath is to add pure iodide of silver (not potassium) till saturated, if you like; it will do no harm, for the nitrate bath will dissolve the film as it forms on the plate, more or less, until the bath becomes saturated with iodide. It is not possible for the presence of iodide of silver to cause the trouble usually attributed to it. In my opinion it is the products of organic decomposition, and the formation of the salts of cadmium, &c., in the bath.

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* Read before the Chicago Photographic Association.

Let us take a few figures and see what our nitrate bath consists of, after using it awhile. We will figure on cadmium collodion. The atomic weight of silver is 108; of cadmium, 56. Now, as often as there is 108 grains of silver withdrawn from the bath by using cadmium collodion, this silver is replaced by 56 grains of cadmium; if potassium collodion, 39 grains; ammonium, 18 grains; lithium, only 7 grains. You can see by comparing the atomic value of silver with the bases of the iodine and bromine salts, usually used in collodion, that cadmium, the one largely used at the present time, produces in the bath, in proportion to the silver withdrawn, a very much larger proportion of its salts than the other bases. Now, in addition to this salt there is a large amount of other impurities carried into the bath, such as I have already mentioned. A member has said that a pin-hole, under the microscope, looks like a bundle of iron. If he had said it looked like cadmium, I think he would have hit it just right. The South American writer conveys the idea that what is called over-iodizing is simply the want of silver. It is not necessarily so, yet more silver will correct the evil for the time being in this way. Nitrate of silver has an affinity for organic matter, consequently the fresh silver chemically unites with the organic impurities in the bath, thereby increasing the power of the exhausted silver, while it weakens the influence of the impurities in proportion to the increase of the silver. Black's acid bath has demonstrated the fact that a very weak silver solution will do the work, provided it is kept acid enough to keep the impurities from precipitating on the film, thereby preventing a free action of the silver, or a free union with the bromine and iodine in the film.

As to the question of temperature, the correspondent says: "Elaborate and learned articles have been written about the importance of temperature, and most ingenious methods have been described for keeping the bath packed in ice in summer, and in hot water in winter, when, lo and behold, another man went to work and experimented, and clearly demonstrated that a bath heated almost to a boiling point and cooled a little short of freezing gave exactly the same kind of negatives in both cases." Now, Mr. President, this may be true, but it does not prove that there is not a degree of heat that is best adapted to picture making. We all know that this warm month of June is not the best temperature for producing ice; yet I see an account of a skating-rink in Europe where its patrons are daily sporting on a fine sheet of ice, and it is easily explained on philosophical principles; and so is this man's experiments—for in the first place, if all the chemicals he used and the surrounding atmosphere were not the same temperature, the experiment of the almost boiling bath is not the test it would seem to be, for the temperature of the thin coating on the plate would be lowered so very quickly by imparting a portion of its heat to equalize its temperature with its surroundings that before the plate can be transferred to the camera and exposed much of the influence of the heat is lost; consequently these kinds of experiments do not amount to much, as I have said, unless all the chemicals used and the surrounding atmosphere are the same. We will take this man's experiment in this direction for what it is worth, and review the philosophy of light and heat. You will say, how is it about a cold bath? Negatives have been made when the chemicals and the atmosphere are nearly at the freezing point? I will attempt to explain that after considering the action of light and heat on matter.

Philosophers tell us that light and heat are analogous—one is convertible into the other; they differ only as colours differ. The effect of all the radiant forces on matter is to produce motion in proportion to its intensity; this motion produces expansion or throws the atoms farther apart, and this expansion, if carried far enough, produces a chemical change. Light produces chemical changes in this way, so says Youman, page 159:—"As the increase of vibration throws atoms beyond the sphere of cohesion, so it also throws them beyond the sphere of affinity, producing decomposition. In cohesion the atoms are alike and vibrate alike; in affinity they are totally unlike, and vibrate at different rates.

"Elements having the highest and lowest atomic members, as hydrogen and the noble metals, do not combine at all, their motions being so different that they cannot keep together.

"Others move at such a rate that they unite only feebly, and the slightest increase of atomatic motion separates them. A stream of waves falling upon a group of unequally vibrating atoms, acts upon them unequally, and thus tends to increase the diversity of their motion. When the successive wave-strokes are so timed to the motion of an atom as to increase its oscillations, the effect accumulates, the atom is detached and thrown within reach of new affinities. In this manner one compound is destroyed and another formed."

The lights and shades in a negative are produced by the intense light creating more motion than the weaker or shaded parts, causing a greater expansion of the iodine and bromine, thus throwing more of their atoms beyond the sphere of affinity for the silver in the light than in the shaded parts. Thermal or heat rays produce the same motion only in a more violent manner, and if carried to a certain intensity it will not only by its motion destroy affinity, but will destroy cohesion in the most tenacious metals, and tear its atoms asunder.

If the heat is sufficient to produce more powerful vibrations or greater expansion than the chemical rays of light, it overcomes or destroys the delicate action of the chemical rays, which produces the fine gradations of lights and shades by throwing too many of the atoms of bromine and iodine beyond the sphere of affinity for the silver, thereby causing, when developed, too much deposit in the shadows. Overtiming produces the same effect.

This action of course can be carried to an unlimited extent. Now let us examine the table of expansion of silver and some of the fluids and gases. Between the freezing and boiling points—that is, 32° and 212° Fahr.—the cubical expansion of silver is only $\frac{1}{524}$, while alcohol is $\frac{1}{9}$, air and the permanent gases $\frac{180}{491}$, or increases more than one-third its size.

I have not been able to find the exact amount of expansion of iodine and bromine, but it is fair to suppose that it is very great, particularly bromine, as it boils at 117° Fahrenheit, and iodine melts and passes off rapidly in a dense vapour at 225° or a little more than the boiling point of water. Now, Mr. President, who will say with these facts in view, that temperature does not affect the working of our chemicals; or, what is nearer the truth, it affects the delicate action of the actinic rays. The fact of being able to produce a fair quality of negatives at or near the freezing point can only be accounted for on this basis: Water is an exception to the general rule of expansion and contraction. As the temperature of water falls from the boiling point it contracts until it reaches 39$\frac{2}{10}$ Fahrenheit, which is the maximum density of this fluid. From this point it expands until it reaches the freezing point, 32°; at this point its volume is the same as at 48°. This fact is of great importance in nature, for if it were not for this exception our rivers and lakes would begin to freeze at the bottom, and become a solid mass of ice throughout all the cold regions. This same exception aids the chemical rays in their work of decomposition, as this expansion is the effect of an increase of motion among the atoms of water which surround the chemical atoms, and as the motion of the chemical atoms must be influenced by the motion of their surroundings, they are more sensitive to the chemical rays just before the fluid reaches the freezing point than at any degree below 48°.

Those that have attempted to work the daguerreotype process at or near the freezing point will readily realize the above facts, for it is next to an impossibility to coat a plate over dry iodine at this low temperature, the contraction is so great that there is scarcely any vapour arising from it.

Mr. Greene said: The subject of Mr. Hall's paper has been under discussion some time. It has been the general impression that there was such a thing as an over-iodized bath, and that pin-holes could not be filtered out. I fully agree with Mr. Hall, and believe that there is no such thing as an over-iodized bath. These impurities, of the nature of a glutinous substance, cause the pin-holes, and the larger of these floating particles are easily filtered out—it is not iodide of silver. I have made up a new bath, added iodide of silver to saturation, and it worked a long time without the trouble in question. These pin holes are foul matter, and I think the main cause is in the gun-cotton of our collodion.

Correspondence.

THE EDINBURGH EXHIBITION.

Sir,—The last number of the News has just reached me. Unless you are indulging in a joke at the expense of the eleven gentlemen who met with such a crushing defeat, at our last special meeting, surely to be credited with "noble and chivalric generosity, sublime self-abnegation, charming and edifying as it is rare," "an honour to the society to which they belong," must be more than compensation for being deprived of the power of including those in this city, who wished to do so from competing for prizes at the coming exhibition. If serious—though I find it difficult to believe you are not speaking in bitter irony—will you allow me, an amateur, who knows nothing and desires to know nothing of the unfortunate differences which have of late arisen in the society, to give you my reasons for not being able to quite appreciate the honour of being associated with this "noble and chivalric" minority? The first intimation I had of what was going on was the notice received late on the Saturday before the last special meeting. On inquiry, I found that at the previous meeting the motion we were asked to reconsider had been carried by a majority of *one* by electing a new member, not by ballot, as provided by the rules of the society, *and his voting the same evening.*

Curious to know what possible reasons could be assigned for what appeared to me the most extraordinary proposal ever made to a photographic society. I went to the meeting, and attentively listened to Mr. Neilson.

Imagine my surprise when I found at the conclusion of a speech which most certainly contained but little of what he professes to give as the substance of it in your last number, he adduced only the following:—The ill-feeling and jealousy certain to arise, and the fear some dishonest artist might send his negative to Berlin or Paris to be retouched, gain a prize, and thus obtain a prestige to which he was in no way entitled. I could not until that evening have believed that a knot of Scotchmen could have been found unblushingly to come forward and crave to be heard in their own condemnation, unblushingly to proclaim to the world that, like children, they were so actuated by ill-feeling and jealousy towards each other, they could not compete for prizes. I fancy I can see their blushes as they read of the chivalric generosity you assign as their motive. It requires a stretch of the imagination to which mine is wholly unequal to conceive men actuated by ill feeling and jealousy being capable of sublime self-abnegation, noble and chivalric generosity. The argument regarding the Berlin or Paris retouching, unless Mr. Neilson claims a monopoly of dishonesty for photographers in Edinburgh, amateur and professional, may be good for giving no prizes at all; but if he believes, as doubtless he does, in the possibility of such dishonesty outside of it, what does it matter to him whether the dishonest photographer be a resident of Edinburgh or Timbuctoo? The answer is of course obvious and well understood here, so well understood that while his following has decreased at last meeting from thirteen to eleven, had I had notice earlier, I alone could have obtained a dozen votes to swell what he sneeringly describes as the "well-drilled" majority. I further tell him that had he succeeded, so clearly were the motives of his minority seen through, the Academy's rooms would not have been available for the exhibition, and that, while they held out no unmanly threats of resigning, a considerable number of the members had resolved on doing so. Mr. Neilson's resignation, like his motion of expulsion, with which he threatened a member, is, I take it, still in the future. More ill-feeling and jealousy have been caused by the manner in which this small minority has endeavoured by surprise to exclude resident photographers, against I venture to say the wishes of nine-tenths of the society, than would have been caused by competition for medals at ten exhibitions.—I remain, &c., A. Williamson.

15, *Moray Place, Edinburgh, July 10th.*

THE PATENT IN GELATINE PELLICLE.

Sir,—I am exceedingly obliged to Mr. Brooks of Abergavenny for the information he gives in your last issue regarding Mr. Kennett. He fails, however, to comprehend the difference between *pellicle* and *emulsion* when he says, "I was at his house some months before a gelatine emulsion process was even published, when he showed me plates that he had been experimenting with several years before, and also his notebook containing his experience in the matter up to that time, so you will see that Mr. Kennett is not guilty of cribbing information from other people and patenting the same, which I take to be the meaning of Colonel Wortley's letter." It is not a question of gelatine *emulsion*, but of gelatine *pellicle*, regarding which Mr. Brooks offers no evidence. Dr. Maddox published the gelatine emulsion process in 1871; Mr. Brooks antedates Mr. Kennett's work with gelatine emulsion several years and some months prior to that publication. It is remarkable that during those several years not one single word was published by Mr. Kennett about so important a discovery; and it is remarkable that Mr. Kennett made no sign whatever as to his discoveries till the following two editorial paragraphs were published in your contemporary.

(*British Journal*, *August* 15, 1873.)

"*Substitute for Collodion.*—Among those who are actively employed in experimenting with a view to providing an efficient substitute for collodion in the bromide emulsion process is a well-known amateur, Mr. Kennett, of Maddox Street. This gentleman has, within the last fortnight, resumed some experiments with gelatine, which he began several years ago, but discontinued from not having obtained such vigour as he required. Since the subject has been brought so prominently forward as it has of late, Mr. Kennett has repeated his former experiments with a considerable increase in the proportions of the bromide. The result has been singularly successful. We have now before us two negatives with a film of such smoothness and hardness as might easily be mistaken for albumen, and altogether we are pleased to be able to say that, in our next, we shall publish working directions, which have been kindly promised by Mr. Kennett. This gentleman appears to have overcome a difficulty encountered by several, viz., that of making the emulsion to 'keep.'"

(*British Journal*, *August* 22, 1873.)

"Although we are not yet in a position to place before our readers any reliable gelatine-bromide process, we hope to be able to do so very shortly. Mr. Kennett, in whose name we last week promised to furnish details of a good method of working, informs us that he has not had time, since making that promise, to overcome certain difficulties connected with his process, and desires to be excused for a short time."

Now, I beg to call your attention, and that of the photographic public, to the fact that the promises here so definitely and distinctly made were broken, and that nothing more was heard of Mr. Kennett till he took his patent on the 20th of November in that same year. We may, however, imagine why he broke his promise to publish, seeing that, on the 14th of November, Mr. Johnston had published his valuable idea, by which an emulsion is turned into a solid pellicle, and Mr. Kennett appears at once, struck with its commercial value, to have taken it to the Patent Office, and endeavoured to secure Mr. Johnston's idea for his own personal benefit. Mr. Brooks calls this "cribbing," a very expressive word, and one with which I have no reason to find fault. According, then, to the evidence given by Mr. Brooks, and that coming from other sources, we find that Mr. Kennett has been working for at least eight or nine years at gelatine emulsions, and has never during that time contributed one word to photographic knowledge; that in August, 1873, he promised to publish at once details of his work, that he did not do so, but on the 20th of November took out a patent for what had been published by Mr. Johnston on the 14th of November, and by Mr. Nelson in 1839, and there, I conceive, the matter rests. It is a pertinent, and, I venture to think, a serious question. Has the photographic public been fairly dealt with in this matter?—Faithfully yours,

July 11. H. Stuart Wortley.

PROTO-NITRATE DEVELOPER.

Dear Sir,—My last letter was written from Abergavenny, and, on my return last evening, I found in your last issue a letter from Mr. J. Spiller respecting the proto-nitrate of iron developer, and I am sure Mr. Spiller is always ready to give honour to whom honour is due in all matters relating to photography. I was not aware when I read my last paper before the South London Photographic Society who was the inventor of the proto-nitrate developer, and the method of forming it by double decomposition with either of the nitrates of lead or baryta; it was in use before I had much to do with photography; but whoever was the inventor, I will now take the opportunity of thanking him heartily for introducing such a valuable salt for the purpose. If I had known it at the time, I should have mentioned it. I hope, in the course of a few weeks, to be able to send you an article of my further experience with the proto-nitrate developer. I am now using it under the same form I gave in my paper with the collodion as a restrainer, and find it to work better than any developer I have ever used. I have now a bottle made up, and for six weeks it has not changed colour or given any deposit. I now think it will come again into use, now it can be kept in solution any length of time without decomposition.—I am, dear sir, yours very truly, W. Brooks.

9, *Stratford Green*, *July* 12.

DEVELOPING ENLARGED PRINTS WITH PYROGALLIC ACID.

Dear Sir.—In making paper enlargements, I have been in the habit of using gallic acid and acetate of lead, as developer; but finding the prints lacking in brilliancy and colour, I have lately adopted the plan proposed by Mr. Thomas Heaviside in the Year-Book for 1873: using nitric acid with the silver in the sensitizing bath, and developing with pyrogallic acid 2 grs., citric acid 4 grs., water 1 ounce. The pictures are wonderfully bright and good in colour; the half tones in an intense negative are well rendered; but on looking through them they seem to be stained a nasty brown within the paper, through the whites as well as the shades: will that in any way affect the permanency of the enlargements? The pictures by reflected light look clear enough; it is only on looking through them that the stain or colour is visible.—Yours respectfully,

B. W.

PS.—The pictures are obtained in half the time, the paper appear so much more sensitive than by the old plan.

[The brown patches visible by transmitted light are doubtless due to imperfect fixation, and will cause surface spots of discolouration eventually. To prevent their recurrence, after development thoroughly wash the print before placing it in the hypo, which should be strong, and leave the printing until no such opaque spots are seen on examining by transmitted light.—Ed.]

Talk in the Studio.

The Woodbury Printing Process.—We understand that during the last half-year not less than a million and a half of prints left the establishment of the Woodbury Printing Company!

Mr. Alderman Nottage and the Shrievalty.—In reference to the announcement in our last to the effect that Mr. Alderman Nottage, of the Stereoscopic Company, had from press of other duties declined to undertake the office of Sheriff of the City of London for the ensuing year, on account of the pressure of business engagements, we have since been pleased to learn that his acceptance of that office is postponed rather than declined, and that, the year following, he will have time to make anticipatory arrangements, and hopes to have the honour of being elected to fill that distinguished position.

Exhibiting a Portrait without Permission.—A photographer in Albany, N. Y., recently disposed of his business to another. The new administration, in rummaging among the negatives, discovered one of the wife of the old proprietor. She being an attractive looking woman, he printed from the negative, and exhibited the finished print among his specimens in his show case at the door. The husband of the lady discovered the picture, and without further ceremony applied to a justice for a warrant for the arrest of his successor, but was informed that the only remedy the law afforded was in his purchasing the picture, and removing it from the exhibition case.

Dangers of Season Ticket Portraits.—Our American cousins make merry over the use of portraits on season tickets A curious contretemps is described in a N. Y. contemporary as follows:—All that are entitled to season tickets to the Centennial are obliged to have their photographs placed on the same, that the gatekeeper may know that the company are not being swindled out of their just dues by the transfer of said tickets to some impecunious friend. They thought No. 1 had been captured the other day, but were fooled. It seems that a reporter for one of the newspapers had placed his photograph on his ticket, showing a full beard, moustache and flowing locks. The weather turning warm admonished him that it was time to shave, so he had a clean shave, his hair cut, and head sand-papered, in which shape he handed in his ticket, and was politely told by the gentlemanly gate-keeper, that he would retain it, as the party whose picture was on the document and this sheared individual were not at all alike. The reporter tried to convince the gate-keeper that he was the original Jacobs, and showed the strawberry mark on his arm, but the only thing was the photograph, and that told the story. The ire of our reportorial friend was excited, and he raised such a breeze that the police were called, and Mr. Reporter walked off to the calaboose, where he was found by his friends, and after some little trouble released, being led over to the studio of the C. P. C., for another sitting. Should he conclude to let his hair and beard grow during his labours at the Exposition, he will have daily sittings, and thus be able to satisfy the watchful gate-keeper that he is the simon-pure and only original.

Centennial Portraits.—At the department of Public Comfort. in the Philadelphia Exhibition, there is an artist duly authorized, to take such pictures and paste them in the tickets with the particular kind of paste required to make them legal; but the crowd there is so great that it spoils a whole day for a person to go through the various red-tape machines necessary to the production of a photograph duly pasted and stamped. Rather than waste so much time, a great many ticket-holders are getting their shadows taken by down-town artists, and will take their chances on having the pasting properly done. Of course it is of the highest importance that the picture, in each instance, should be put in and fastened just so, and in no other way. Should a different kind of mucilage be used from that authorized by the Centennial Boad, or should the picture be a trifle larger or a hair's breadth smaller than the prescribed dimensions, or should it be inadvertently put on wrong end up, or wrong end down, or with the nose pointing in any other direction than towards the Exposition grounds. in such a case the dignity of the Board would be offended and the ticket become a worthless scrap of pasteboard representing nothing, and fit only to serve as a warning against Centennial carelessness and folly. There is nothing like having everything done up according to the most rigid rules of red-tape, and if everything is not thus done here, it will be no fault of the management of the Centennial show."—*N. Y. Tribune.*

Electro-Actinometer.—A differential electro-actinometer, for determining the co-efficients of absorption of ultra-violet rays by different media, has been described to the Paris Academy by M. Egoroff. It consists of M. Edm. Becquerel's actinometers placed one above another, and so arranged that the current of the one is neutralized by the current of the other; a very sensitive galvanometer is interposed in the circuit.—*English Mechanic.*

To Correspondents.

Hope.—The matt silver stains on your negative which you describe are, unfortunately, very familiar torments to the photographer, especially in hot weather. Their presence may be encouraged in various ways; but they chiefly arise from the use of a collodion yielding a horny repellent film. One sample of commercial collodion, excellent in every other respect, is especially prone to this defect, especially when new. As the collodion ripens and gives a less horny repellent film the trouble disappears. The addition of two or three drops of water per ounce to the collodion often proves a cure. Immersing the plate in the silver bath as soon as possible, before the film has too thoroughly set, checks the tendency. When the defect is troublesomely present and cannot be got rid of by other means, dipping the plate in a neutral silver bath before developing will effect a cure. Two or three thicknesses of wet blotting paper placed behind the plate in the dark slide sometimes prevents the troublesome tendency.

3. L. F.—The heavy effect in the vignette of which you very properly complain, is due to the use of a background screen much too dark. Where prints are vignetted a light screen should be used for the background screen in producing the negative, as it is almost impossible to secure gradation from nearly black to the white margin without a heavy unpleasant effect. You may tint the white margin and make a grey vignette, and so effect some improvement.

C. P. O. T. N.—The best mode of recovering silver from the hypo bath where proper facilities exist, and the operator is familiar with the work, is by the use of liver of sulphur, which precipitates the whole of the silver as a sulphide. A good and simple plan, useful where things are done on a small scale, consists in immersing the plate of zinc in the solution, adding a few drops of sulphuric acid. The solution may be tested with liver of sulphur to ascertain when all the silver is thrown down. If any silver remain it will be thrown down at once as a sulphide, on adding the sulphur salt to the portion to be tested. The silver thrown down should be washed with sulphuric acid, diluted with an equal bulk of water to remove traces of zinc Communications for us should always be sent to the publishing office.

R. K. B.—Our publishers can supply you with various hand-books; but perhaps none is better than that of Captain Abney, although several are more costly.

R. Gordon.—The defect in the negative on a gelatine pellicle plate appears to us to be due to other causes than the character of the sensitive plate. Unequal illumination appears to be greatly the cause of the defect. The lens appears to be used for a plate it does not cover well, and gives much greater illuminations in the centre than the edges. The scene at Din lin also is a trying one. There is foliage at each end where the imperfect illuminations exist, and very light objects in the centre where there is excess of illumination. We have not had much personal experience of pellicle plates, but have not heard of the film cracking. Probably Mr. Kennett himself could give you some hints on this defect. We are glad to hear from you again.

J. G.—So far as our personal experience and judgment go, we should select No. 1.

O. S. (Loobacherra).—We should select as easiest to work, and giving most uniform results, No. 1. They are not rapid, but trustworthy. 2. We cannot say; but think doubtful. If you wish to try the process, make the preparation yourself; we have given full instructions more than once. 3. Packed as you describe, dry plates ought to keep well during the voyage out. Air or damp had evidently found admission to those you mention as injured at the edges.

Dave.—We cannot tell you the precise temperature at which it is best to use a burnishing press for photographs; but a little experience will soon enable you to judge. A little Castile soap dissolved in alcohol applied to the surface of the print is beneficial. It should be dry, and dries at once. The print should be placed face in contact with the burnishing edge.

Syphons.—Sir T Parkyns informs us that he sent "Gustavo" one of his syphons described in the News when the subject was discussed a short time ago, and that he doubts not that "Gustavo" will report favourably upon it to "Ignoramus."

B. F.—We do not recommend, as a rule, the use of home-made varnishes, as it rarely happens that persons unaccustomed to the selecting of resins and their solvents can understand the subject sufficiently well to succeed If you wish to try, however, the following is very safe:—Take good orange shellac, and add about a drachm to every ounce of methylated spirits. Stand in a warm place, covered up or corked, of course until all is dissolved. Then decant off the clear solution. This will give a good negative varnish, somewhat dark in colour, but not sufficiently so to be seriously injurious to the negative. The bleached shellac of which you complain is almost invariably spoiled for negative varnish by the process of bleaching, which destroys its hardness and toughness, making it comparatively soft and friable. It often contains, moreover, traces of the chlorine with which it was bleached, and this acts on the negative.

Young Hand.—No medals have been offered by the London Society (the Photographic Society of Great Britain) to contributors at the next exhibition. We presume that all the announced conditions of the Edinburgh Society will continue except that excluding photographers resident in Edinburgh or members of the Edinburgh Society from competition, which has been rescinded.

A Printer.—Mr. Edge never published the method whereby he produced the soft landscape backgrounds to which you refer. Excellent imitations were produced by various photographers by ordinary double printing, the negative being produced with a light grey. but not an absolutely white, background. This tint in the background upon which the landscape was printed gave the soft atmospheric effect.

R. B. G.—The stain arises from the contact of hypo with the print before it was fixed, probably either from dirty fingers or a dirty dish.

Several correspondents in our next.

The Photographic News, July 21, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Amateur Photography in England—Cheap Portraits—Photographs on Soap Tablets and Wax Candles.

Amateur Photography in England.—The pre-eminence of English landscape photography is without doubt due in some measure to the large number of amateur workers in this country. If other countries claim to produce better photographic portraiture than we do (although it is rather in the fine and elaborate retouching of their negatives than in anything else that distinguished Continental photographers are known), it is pretty generally acknowledged that we can hold our own in landscape work. Far be it from us to infer, however, that amateurs have alone made landscape photography what it is in England. The names of Bedford, Robinson, England, Saunderson, and a great many others, have only to be mentioned to show how much the cultivation of this particular branch of the art is due to professional gentlemen; but we think, nevertheless, that the number of amateurs in this country has had some influence in earning for England the high position it holds in landscape photography.

In Germany, in Austria, and in France, the number of amateur photographers is nowhere so great as in England, and if we but glance at the list of members who compose the photographic societies in the capital of those countries, this circumstance is more than ever apparent. In London, the photographic society is pretty well half made up of amateur photographers, or gentlemen who have not to depend upon photographic art for a livelihood, while if we glance down the long list of names that form the French Photographic Society, or the Berlin Society for the Advancement of Photography, or the Vienna Photographic Society, we find amateurs to be very rare indeed. In England one of our best, if not actually the best dry plate worker was an amateur, while the medals so rarely given in this country for the encouragement of photographic art have fallen, not unfrequently, to the same class. If France has known a Duc de Luynes to forward photography by means of large money prizes, so in this country we have had a wealthy amateur ready to come forward to assist by example and substantial reward the progress of the art. The mere fact that a large number of the members of our Photographic Society are independent gentlemen, and subscribe to the funds of the Society for the main purpose of furthering photographic art, alone shows how much interest there is felt for progress outside the circle of professional photographers in this country. Certainly, if it were not for our amateurs we should not have made that progress in dry plate photography, in emulsions, and in other branches of the art that might be specified. In our London exhibitions half of the walls have been covered by the productions of amateurs, whose works, as every one knows, are by no means to be despised. On the other hand, in France, there is little activity shown by this class, and, according to our correspondent, who recently reported upon the Photographic Exhibition at Paris, there were scarcely any pictures at all exhibited by French photographic amateurs. A year or two back, on the occasion of the publication of our Year-Book, a foreign writer, in congratulating us upon the large number of well-known writers who make their appearance in print on such occasions, gave it as his opinion that such a work could not appear in France or Germany. In those countries the editor must of necessity, he said, also be the writer of the book, for workers in those countries were exceedingly jealous about making public any little improvement or discovery that was made. In England, however, both amateurs and professionals freely communicated one to another whatever points of progress they made, and hence it was possible to publish every year a volume of practical information written by a hundred skilful photographers. In this country amateur photographers are continually at work searching and investigating, and as they have more time at their disposal for experiment than their professional brethren, it is not surprising that a large amount of the progress made is due to them. England may well be proud of her large band of amateur photographers.

Cheap Portraits.—An example of cheap photographic portraiture came under our notice the other day. A little box of vestas of Italian workmanship, and made, indeed, at Milan, having two genuine photographs, back and front, was purchased for one penny. The photographs depicted two Italian costumes, the models being well chosen, and skilfully draped, and as only the busts were shown, the features were well rendered. As these little card boxes with elastic band and their fill of matches must be sold wholesale for something like a halfpenny a-piece, but little profit is likely to accrue to the photographer; but, nevertheless, we may fairly presume he has been paid for his labour and pains. The prints were not in silver, but evidently produced by some collotype process, so cleverly, however, as to have lost little of the sharpness and delicacy of the negative. It is difficult to realize anything cheaper in the way of photographic printing.

Photographs on Soap Tablets and Wax Candles.—Among the various attempts to make use of photography in commercial matters may be mentioned an application of photographic images to fancy soap tablets and wax candles. The carbon process lends itself so well to the application of images to all sorts of surfaces, that it is not to be wondered at that the perfumer and soap maker should make some use of this method of printing for ornamenting their goods. Upon transparent slabs of soap, or upon fine paraffin candles, photographic films might be applied with but little difficulty, and the very fine nature of the image would not in any way interfere, we should think, with the uses to which the articles are put. Already three or four years ago, we believe, Messrs. J. C. & J. Field, the well-known candle and soap manufacturers of Lambeth Marsh, made some experiments with a view to ornamenting their wares by means of photography, but, from the circumstance that the process has not been employed for the purpose, we presume that the firm was not satisfied with the experimental results produced.

OBSERVATIONS IN THE TYROL.*

BY H. BADEN PRITCHARD,

Author of "Beauty Spots of the Continent," &c.

There is an art exhibition at Munich just now, which has been visited by a large number of visitors from South Germany. I am sorry to say I cannot speak very highly of it; it reminded me much of the International Exhibitions of South Kensington which have been held during the past few years, and which were nothing less than gigantic bazaars. Here at Munich there are a few pictures, some good and others indifferent, and a large collection of pencil studies from the local art school, but the greater part of the exhibition is taken up with pianofortes, china, glass, bronze work, furniture, and other objects for general household use. To people who have a thirst for shopping, walking from one stall to another may be some amusement, but one can hardly see why a shilling should be demanded for viewing objects which are to be seen every day in the shop-windows for nothing. A showcase of fine portraits by Hanfstaengel, of Stuttgart, finds a place in the exhibition, but there are no other photographic productions worthy of note. Season tickets may be purchased for the exhibition, but every holder of them must have his or her portrait pasted at the back of the ticket to ensure admission.

I regretted all the more wasting a couple of hours on this exhibition, as Munich contains, as everybody knows, some magnificent collections of old and new paintings which must perforce be seen by every visitor. The old *Pinakotek* contains representatives of every school of painting, with the exception of the British, and Murillo and Rembrandt are very adequately represented, while of Rubens' works there is a whole gallery full.

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* Continued from page 331.

The collections of pictures were formed by two recent kings of Bavaria who were themselves artists, and spent most of their money in encouraging art. To them is due the circumstance that Munich at the present day ranks as one of the finest capitals of Europe, its magnificent public buildings, gardens, and squares, being in some points unequalled.

The day before yesterday I quitted Munich, and put on my knapsack for the first time. Taking the train to Penzberg, at the foot of the Bavarian Highlands, my companions and myself trudged off on our way, the mountains rising higher and higher as we proceeded. This may be called the lake district of Bavaria. There is the Starnberger See, navigated by a steamer, where Munich holiday-makers come to pass the day; and farther on, the pretty Kochel See, and afterward the magnificent Walchern See, fit to take rank with the Swiss lakes. Here my little 5 by 4 photographic apparatus was brought into requisition for the first time, and half-a-dozen exposures given. If only my negatives in the roller dark slide should turn out as successful as the trials made before quitting home, I shall be truly fortunate. Indeed, one cannot well imagine a more simple and ingenious little apparatus than that with which Mr. Warnerke has provided me. It seems too good to be true. I focus, put in my roller dark slide, and take my picture. I then sit down in any convenient shady spot, move two brass studs to release the rollers, which have been kept firm by their means, and then proceed to roll the band of tissue from one roller to the other. I open the little dark window of the slide, about as big as my finger nail, and as the last bit of band exposed was numbered 5, I turn the handles of the rollers until I see No. 6 appear before the very little window. The two studs before named are then twisted round, and so clamp the rollers in their places, so that the sensitive band remains at tension between them. I am then ready to expose again.

Now that I am getting skilled in moving on the tissue from one roller to another, watching one number disappear and another making its appearance before the tiny window, the change can be effected easily in a minute. In fact, as I said before, it is simply the luxury of photography.

Yesterday I arrived at this little place, Mittenwald, in the middle of a district which I have already visited twice before, and which is situated among the most lovely scenery. Two grey craggy peaks, the Welterstein and the Karwendel, whose silvery pinnacles glisten again in the sunlight, overlook the quaint picturesque street of which the town is composed. The chalet-built houses project quaintly one before the other, step-like, along the thoroughfare, many ornamented with painted frescoes of the saints, and bearing old mottoes and inscriptions. A half-covered torrent runs along the middle of the road, as in the case of many mountain villages, and from the overhanging gables and bark-covered roofs project long wooden waterspouts, to carry the drainage over the heads of passers-by, and let it fall into the mountain-stream in the street.

The inhabitants of Mittenwald are engaged in the manufacture of stringed instruments, and you may purchase a violin here for as low a price as a florin. Double basses, violincellos, guitars, zithers, and fiddles are made at every cottage, and upon the roof opposite the window I am writing at, I can see a string of a dozen fiddles hanging on a line upon the roof. It is said that the instruments are made chiefly for the English and American markets, but I should think that the Germans themselves absorb a large number of them. Two large sawmills are engaged in cutting up the wood for the framework of the instruments, and, judging from the piles of planks that are used, one would think that all the fiddles in the world issue from this little spot.

Mittenwald, which, as most of our readers will know, means "in the middle of the forest," is a very apt name for this town. It is surrounded on all sides with forests of dark firs, and coming here we had to penetrate a dozen miles of dense foliage. In some parts, it was like wandering under a vast vaulted roof, so sombre and cool was it under the trees. The broad valley is so quiet and secluded that there is ofttimes not a sound to be heard as you pace through the deep forests, and behold from time to time the grey pinnacles of the Karisendel piercing the vast sea of foliage. It is into the valley of

"Isar, rolling rapidly,"

that we have penetrated, and the tearing white torrent does roll rapidly here, without exaggeration, for the milk-white water has only just issued from the glaciers above.

Travelling in these parts is a very modest undertaking. There are no hotels in the Bavarian highlands, any more than in the Tyrol; only inns of the simplest kind are to be met with. This means that there are no aristocratic tourists to be met with, and no Englishmen. At the Walchern See inn, the most charming lake in Bavaria, I found the name of only one Englishman registered in the stranger's book during the last nine months; and at the same inn I had for my dinner a dish of game, ragout (roebuck), and macaroni, which cost me exactly eighty pfennigs, or about ninepence. My day's expenses, including Bavarian beer *ad libitum*, does not amount to five shillings a day. But then you must be content to live as German travellers do, modestly, and without expensive wines and half-a-dozen dishes for dinner; indeed, you could not obtain the latter, if you wished.

Two miles from here is the Austrian frontier, and the famous pass of Scharnitz, where Marshal Ney defeated the Austrians at the beginning of the century. It is the scene of many a Tyrolese struggle, but after the victory of the French they so effectually reduced the fortifications that the Austrians have never attempted to restore them. I hope to cross the border to-morrow on my way to the Oetzthal; I shall ascend the Oetzthal glacier, and, crossing that barrier of ice, descend among the vines and olive trees of South Tyrol.

Mittenwald, July 7.

NOTES ON THE SENSITIVENESS OF SILVER BROMIDE TO THE GREEN RAYS AS MODIFIED BY THE PRESENCE OF OTHER SUBSTANCES.

BY M. CAREY LEA.*

In order to register the effects produced, a glass negative of a suitable character was placed under these three glasses, and under the negative a glass carrying the film, to parts of which the colouring matters have been applied. Complete contact was obtained by a pressure-frame, and the exposure was made directly to the sun. With a good sunlight, in winter, the exposure was about forty-five seconds, corresponding to, perhaps, twenty or less of summer light. The development was in all cases the alkaline, viz., pyrogallol and ammonium carbonate controlled with potassium bromide.

As already said, the main object of the research was to arrive at a solution of the question whether any red pigment could be found which would enhance sensibility to the green rays. The following were tried:—

Ammonium hæmateate
Santaline.
Coralline.
Rosaniline.
Ferric sulphocyanide.
Murexide.
Aurine.
Carminic acid.
Naphthaline red.

In addition to these substances of well-established composition some pigments were tried whose commercial names are—

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* Continued from page 329.

Cardinal red.
Saffranine.
Cerise.
Rouge ponceau.
Bordeaux claret.

With the single exception of coralline not one of these substances produced the slightest increase of sensitiveness to the green rays.

It was my intention, in the case of finding any red pigments which increased the sensitiveness to green light, to make a careful study of their absorption spectra by means of the spectroscope, but as none such were found except coralline, its spectrum only was examined.

The power of coralline, however, to increase the sensitiveness of AgBr to green light cannot be considered as any function of its colour, for two most excellent reasons.

1. Coralline exhibits a still more marked tendency to increase the sensitiveness of AgBr to the red ray than to the green. This action on the red ray was observed and published by me in March, 1875, and completely disproves the theory of any special action of coralline upon the green ray. There appears to be a heightening of sensibility to the less refrangible end of the spectrum rather than to any particular ray.

2. The action on green light is not a function of the colour of coralline, because it is easy to destroy that action without destroying the colour. This singular result is accomplished in the following way:—

Coralline appears to be the ammonia salt of a yellow acid. If we place a drop or two of a weak acid, acetic or gallic, in a capsule, and add a few drops of alcoholic solution of coralline, the deep red colour of the solution passes to a clear yellow. With the addition of more coralline solution the colour reappears with its full brilliancy. But the solution, if too large a proportion of the coralline to the acid have not been added, is found to have wholly lost its power of exalting sensitiveness to the green rays, although the amount of colour applied be made the same in both cases.

Absorption Spectrum of Coralline.—With a moderately-strong solution and a narrow slit the transmitted band is confined to the red rays. As dilution increases the band widens, passes the D lines, and transmits all the yellow rays. In all cases the band is continuous, and shows neither intervals nor a second maximum.

Coralline, then, forms no exception to the general rule, as deduced from the examination of fourteen substances of strong red colouration.

Action of Colourless, or nearly Colourless, Substances on the Sensitiveness to Green Rays.

The following substances examined gave an increase of sensitiveness:—

Potassic arsenite.
Argentic arsenite.
Salicine.
Codeia.
Morphia acetate.
Tincture of capsicum.
Ammonium valerate.
Caffeine. (?)

It appears, therefore, that it is not among the coloured, but the colourless, substances that we must look for those capable of enhancing sensitiveness to green light. While not a single red substance could be found that possessed that property, no fewer than eight colourless substances exhibited it.

The following substances neither increased nor diminished the sensitiveness:—

Ammonium hippurate.
,, mucate.
,, malate.
Plumbic arsenite.
Phloridzin.
Parabanic acid.
Tincture of aloes.
Potassic formate.

It was a little uncertain whether two of these substances—phloridzin and potassic formate—did not give a slight increase of sensitiveness.

The following colourless substances distinctly diminished the sensitiveness to green light:—

Brucia.
Strychnia.
Narcotine.
Piperine.
Gentianine.
Podophylline.
Daturine (tincture of stramonium).
Acid ammonium urate.
Aconitine.
Asparagine.
Berberine.

Finding, therefore, no red substance capable as such of increasing the sensitiveness of AgBr to green light, and, on the other hand, many colourless substances which have that effect, I am entirely confirmed in the opinion originally expressed in the pages of this journal—that there exists no relation between the colour of a substance and that of the rays to which it increases the sensitiveness of silver bromide.

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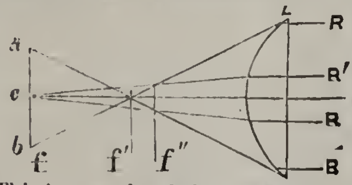
A LECTURE ON LENSES.

BY JOSEPH ZENTMAYER.*

We come now to a somewhat more complicated and difficult part of the subject, the aberrations of lenses, and the modes of their correction. So far we have supposed the lens as very small in relation to its focal length, and that, with such a lens, all rays coming from one point are refracted by the lens in one point again; but in practical optics such is not the case, as lenses of very large aperture are often required in modern optical instruments, and the rays coming from one point are no longer collected in one point, and this optical defect occasions the different aberrations. For over a century the correction of these aberrations employed our most eminent mathematicians, as Euler, Fraunhofer, Herschel, Fresnel, Littrow, Gauss, Airy, Petzval, and others.

The most important of these aberrations are: spherical aberration, chromatic aberration, curvature of field, distortion, and astigmation.



The marginal parallel rays R R (Fig. 10), passing through a convex lens L, cross the axis at f', nearer to the lens than the more central ones R'R', which cross at *f*. This is a result of the spherical surface of the lens, and is called spherical aberration.

If we present a convex short focus lens to solar rays and produce a sharp image of the sun on a piece of white paper we will find that the image at *f*, which is the one made by the central rays (and therefore is the sharpest), is surrounded by a halo *a b*, which is what we call the lateral spherical aberration. This halo is, as you see, produced by the shorter marginal rays R R, after crossing the axis, diverging, and is also called the circle of aberration. *f' f*, the distance of the difference of the central and marginal rays, constitutes the longitudinal aberration. The least spherical aberration is where the two cones intersect each other between *f* and *f*. This aberration is called positive.

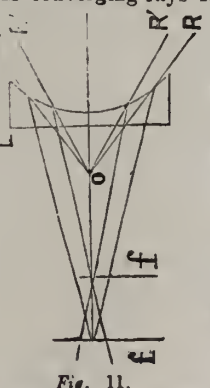


Fig. 11.

If converging rays R R and R' R' (Fig. 11), which we suppose would be collected in the point *o*, fall on a concave lens, the marginal rays R R are refracted stronger than the more central ones R' R', consequently R R will cross the axis farther from the lens, at *f*, than the more central ones, R' R', which cross the axis at *f*. In this case the spherical aberration is of the opposite character, and is called negative aberration. It is evident from the foregoing, that spherical aberration varies with the aperture of the lens, and the material of which the lens is made. Therefore, the larger a lens is in proportion to its focal length the greater is its spherical aberration;—a lens of

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† Continued from page 327.

an aperture of, say, 1-50th of its focal length has no perceptible spherical aberration. The longitudinal spherical aberration increases as the square of the diameter of its aperture, and inversely as its focal length, while the lateral aberration increases as the cube of its aperture, and inversely as the square of its focal length.

Thus, if we have two lenses of the same curvature, made of the same material, but the one of twice the aperture of the other, the longitudinal aberration of the larger one is four times as great, and the lateral or circle of aberration is eight times as great as that of the smaller one.

If two lenses have the same aperture, but the focal length of the one is twice as long as that of the other, the longer one has only one-half the longitudinal, and one-fourth the lateral aberration. As a lens made of a denser medium, say of heavy flint glass or diamond, requires, for the same focal length, a longer radius of curvature than one made of crown glass, it follows that its spherical aberration is less.

The single lens of ordinary glass, having an index of refraction of 1·5, has the form of least spherical aberration when it is a crossed or convex lens with the surfaces of different radii, the proportions of the radii depending on the index of refraction of the material of which the lens is made. For ordinary glass, index 1·5, the radii are as 1 to 6, the shortest curve towards parallel rays. The best form for a lens made of flint glass, index 1·6, is the plano-convex, and for diamond is a Meniscus, of which the convex radius is to the concave as 2 to 5, for radii of curvature.

We see that in lenses of wide apertures the spherical aberration may be considerable enough to interfere with the sharpness of the image, especially if, as in a telescope and microscope, the image with all its errors is magnified by an eye-piece. Let us now see what means we have to reduce, correct, or destroy the spherical aberration. The most simple way is by the use of a diaphragm. A diaphragm is a non-transparent plate, commonly made of metal, perforated in centre. A B is such a diaphragm; c d, the aperture of it. If this diaphragm is placed in contact with the lens, it is nearly equal to reducing the lens to the size of the aperture of the diaphragm, and as we have seen before, the spherical aberration is considerably reduced, but the light also. If the loss of light is of little consequence, this mode of reducing spherical aberration may be adopted with advantage. Another way of reducing the spherical aberration is by adopting for a given aperture and focal length two or more lenses of the same aperture, and the same equivalent focus of the single lens. We have seen before, that two lenses of the same aperture, but their focal length as 1 to 2 to each other, the longer one has only one-fourth of the spherical aberration of the shorter one. Lens M (Fig. 13) has its focus at f. The lenses L and N are of the same aperture as M, but each has twice the focal length of the lens M; therefore each has only one-fourth the spherical aberration of M, but L and N together have the same focal length as M, and as their apertures are alike, the combination L N has only one-half the lateral spherical aberration of the lens M. But by this mode of correcting, it is not possible to destroy the spherical aberration completely, although it is stated in some works on optics that a combination of two convergent lenses was calculated by Sir John Herschel, and said to be free of spherical aberration. This, however, is a mistake, which Herschel himself has rectified in his memoirs.

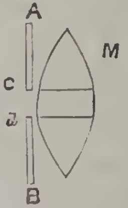

Fig. 12.

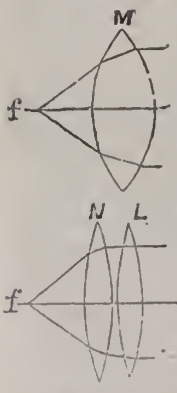

Fig. 13.

We now come to the most important method of correcting spherical aberration, that is, by a second lens of opposite character. Suppose we want to correct the spherical aberration of the positive lens L (Fig. 14) along its axis. ff' is the longitudinal spherical aberration of the rays A B, parallel to the axis A, at the margin of the lens, and B near the centre of the lens L. If we combine this lens with a convergent negative lens, M, it is not difficult to see, by what we learned before, that the lens M has very little power to change the direction of the ray bf' and bring it (say) to F, but it will greatly change the course of Af, so as to bring it also to F, since the prismatic form is greater at the margin than at the centre. Of course, the form of the lens must be suited to the material of which it is made; for our present purpose, both of the lenses may be made of the same glass, but it is much better if the lens M is made of a denser glass, as we soon shall see that the same lens may be used to correct the chromatic aberration also. By this method the spherical aberration can not only be corrected, but the marginal rays can be made to cross the axis farther from the lens than the central ones; in this case the lens is called over-corrected, while if not enough corrected, it is called under-corrected. So far we have considered the aberration of rays parallel with the axis. But magic lanterns, photographic and microscopic lenses, include angles from 40° to 175°, and the foregoing is only applicable to a narrow angle near the centre of the lens. If a lens corrected parallel to its axis for spherical aberration is struck obliquely by parallel rays, the longitudinal aberration is different for two diameters, and is greatest in the plane, laid through the axis of the lens and the radiating point; therefore, the circle of aberration becomes the more elongated, as the more obliquely and marginally the light strikes the lens, until it terminates in a point at their extreme margin, which is known as the coma.

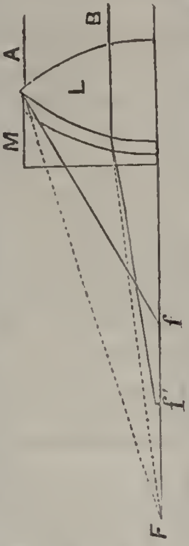

Fig. 14.

L is a plano convex lens; H F, an axis through the optical centre, making a considerable angle with the axis D E. R and R, are parallel marginal rays. The ray, R will cut the axis at F and R, farther off at F, and therefore the image of a luminous point is no more a point, but appears elongated, and in the extreme has the shape of a coma, which in this case is directed downwards. If we reverse the lens, as in the next figure, so that the incident rays fall on the convex side, the coma is directed outwards. We see, we have here, by reversing the lens, opposite comas; and such lenses of opposite character properly combined, at the right distance, and furthermore, by the use of a diaphragm at the proper place, by the spherical aberration for oblique rays, can be reduced to a small amount.

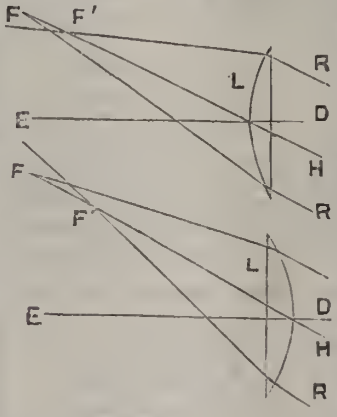

Fig. 15.

(To be continued.)

NOTES ON PHOTOGRAPHY, HISTORIC AND DESCRIPTIVE.

BY CAPT. ABNEY R.E., F.R.S.*

It is not my intention to enter into the history of any of the processes to which I propose to call your attention to-night, as I somewhat dread to enter upon such controversial ground. Probably the demonstration of the production of photographic prints by various methods will be of greater interest than any history.

Astronomy was the religion of the world's infancy, and it can hardly be a matter of surprise that untutored yet inquiring minds, unaided by any distinct revelation, should have attributed to the glorious orb, the centre of our solar system, the possession of divine attributes, and as they gazed upon the wondrous effects of his magical painting, that they should have offered to him their adoration and worship, and carefully noted any phenomena due to him. Thus, probably, the first photographic action noticed would be at a very early period of human existence, when the exposure of the epidermis to his rays caused what is known to us as tan, whilst the parts of the body covered would remain of their pristine whiteness. A photographic action which would be remarked at a later date would be the fading of colours in the sunlight. Ribbons, silks, curtains, and similar fabrics of a coloured nature undergo a change in tint when exposed to it.

I have here a specimen of a pink trimming used by the fair sex, and the lady who presented me with it informed me that it was "a most abominable take in," as the colour "goes" after two days' wear. Her ideas on the subject and my own somewhat differed, for to me it presented a capital opportunity of using the material as a means for obtaining a photographic print in a moderate time. I have here two results of the exposure of this stuff to the sunlight. One was exposed beneath a negative of an anatomical subject, and we have the image represented as white upon a pink ground. The other subject is a map. An ordinary map was superposed over a square piece of the stuff, and placed in sunlight whilst in contact. We have in this case the lines of the map represented as pink on a white ground, from which the colour had faded.

The general opinion is, I believe, that the colour is given off somewhat similarly to the scent from a rose. Were this entirely the case, the light would not act as it does, but beneath the negative or map the colour would bleach uniformly. The bleaching seems to be a really chemical change in the dye due to the impact of light. There are many other bodies besides dyes which change in light, and some of them are of the most unlikely nature. I had intended to show you, to-night, the change that takes place in glass by exposure to light for long periods. My friend Mr. Dallmeyer has in his possession specimens of brown and flint glass which have markedly changed colour in those halves of the prisms purposely exposed to solar influences. In some cases there is a "yellowing" of the body, and in others a decided "purpling."

It is, however, only those bodies which change rapidly in the light that are utilised in photography. The most common amongst these are various compounds of silver, for they are peculiarly sensitive to the action of light. Nearly every silver compound is more or less changed by it, and when I say changed, I mean altered in chemical composition. When we reflect what light is, we can better understand its action. Light, as experiment confirmed by mathematical investigation tells us, is caused by a series of waves issuing from the luminous source, not, indeed, trembling in our tangible atmosphere, but in a subtler and infinitely less dense medium, which pervades all space, and which exists even in the interior of the densest solids and liquids. These waves of ether, as this medium is called, batter against and try to insinuate themselves amongst the molecules of any body exposed to their action, a good many millions of millions of them impinging every second against it. Surely it is not surprising to think, small though the lengths of these waves be, that this persistent battering should in some instances be able to drive away from each of the molecules some one of the atoms of which they are composed.

Take as a type that salt of silver which was, perhaps, the first known to change in the presence of light-silver chloride. For our purpose we may represent each of its molecules as made up of two atoms of silver locked up with two atoms of chlorine. Let us consider the action of the light on only one molecule. The waves strike against it energetically and persistently; the swing that the molecule can take up is not in accord with the swing of the ether. It is shaken and battered till it finally gives up one atom of chlorine; the vibration of the remaining two atoms of silver and one of chlorine are of a different period, and are not sufficiently in discord to cause a further elimination of an atom. The molecule which contains the two atoms of silver and one of chlorine is called a sub-chloride of silver or argentous chloride, and is of a grey violet colour. If, then, I place silver chloride (held in position by a piece of paper) beneath a body, part of which is opaque and part transparent, and expose it to sunlight, I shall find that where the opaque parts cover it, there the white chloride will remain unchanged, whilst on the portions beneath the transparent parts the dark silver sub-chloride will have been formed. Of course, were the paper, after removal of the body, to be further exposed to light, the image obtained would disappear, as a blackening over the whole surface would ensue. In this state, then, the print is not permanent. Fortunately for photography, a ready solvent of silver chloride was found by Sir John Herschel in sodium-hyposulphite. On applying this salt to the image, it was removed, and also one atom of silver, and one of chlorine from the sub-chloride molecule, leaving the atom of metallic silver behind. The chemical change that takes place on the silver chloride can be very distinctly shown by exposing it perfectly pure beneath water. The presence of the sub-chloride is shown by the colour, and that of the chlorine can be exhibited by the usual chemical tests.

In making an ordinary silver print on paper, we have, however, something more present than silver chloride; we have an organic salt known as the albuminate of silver, that is, a combination between albumen and silver. I have in this test-tube a little dilute albumen—the solid constituent of the white of an egg. Into it I drop a little silver nitrate; a flocculent precipitate is at once apparent. The silver from the nitrate has combined with the albumen, and on burning a piece of magnesium wire before it the outer surface shows a darkening; evidently, then, the albuminate of silver is decomposed by light. For silver printing purposes, paper is coated on one surface with a solution of albumen and sodium chloride, and the production of the silver chloride and albuminate is effected by floating that surface on a solution of silver nitrate. When dry, the paper, which is now sensitive to light, is ready for exposure beneath a negative. Here we have two prints produced on paper so prepared. If now I take one of them and dissolve away the insoluble salts in sodium hyposulphite, you see that the colour is of a disagreeable foxy-red tint. To show you how this want of a pleasing tone may be overcome, the other print is immersed in a weak solution of gold, and by a well-known chemical action the metallic gold is deposited on the darkened portions of the picture. Now when gold is precipitated, it has not the well-known yellow colour, but is of a bluish purple; thus the deposited gold mixes its peculiar tint with that of the silver, and after immersion in the hyposulphite we obtain a print whose beauty cannot be surpassed.

(To be continued.)

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* Text of the Lecture at South Kensington, already noticed in our pages.

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PHOTOGRAPHIC PATENTS.

The announcement of a new patent in connection with photography, especially if it touch a commonly practised branch of the art, is generally the signal not only for reclamations and protests in relation to the individual patent under attention, but for a general raid on all patents associated with photography. We have received already a number of letters either questioning the novelty and legitimacy of Mr. Brown's patent for what he has termed the "mezzotint vignette portraits," or attacking photographic patents generally. Regarding the legitimacy of any individual patent, we do not, as we have often stated, undertake to pronounce. We at all times have pleasure in giving the facts *pro* and *con*, so far as they come under our attention, and also their bearings on patent law, so far as we are familiar with it, leaving then the matter to the judgment of each individual reader. Regarding Mr. Brown's patent, we note at the outset that the objections in some instances seem to be based on misconception. One gentleman seems impressed with the notion that the new patent will cover all modes of using double printing for putting in backgrounds. It is not intended, and could not do anything of the kind. All kinds of double printed backgrounds which have hitherto been in use may continue in use, unaffected by the operation of the new patent. The patent is for a special application of double printing, and for that special application only. Again, Mr. Bovey expresses a belief that a method of imitating rough drawing paper has been published in the journals. Undoubtedly: we have described several methods. But the speciality in Mr. Brown's patent is not simply for imitating rough drawing paper, but combining in one picture two effects: securing the texture of rough drawing paper in the background, and that of a fine surfaced paper in the face, vignetting the two effects into each other, so that whilst no junction is observed, the face gains great delicacy by its contrast with the rough texture by which it is surrounded. Whether the method and the result are patentable we cannot undertake to decide, but with our present information we see no reason to doubt it. It possesses the primary qualification for a legitimate patent: it is, so far as we have seen or know, a new result. A high patent authority says:—"The simple combination of two or more known things has been held to be a patentable invention, when the combination is new and the result is something better." This appears exactly to meet the case in question. It is quite possible that the process may have been practised privately by other portraitists; but this is insufficient to bar a patent. It is necessary that the process should have been published to render the patent invalid.*

Apart from the right to patent a thing which the inventor believes to be new, we maintain that in many cases the public are absolutely the gainers by such a course, and we think that the present is one in which it may be easily shown that photographic portraitists generally will gain by Mr. Brown's procedure. After some time spent in experiment, he discovers that a certain novel result is very beautiful, that it may be produced by very simple means, and that absolute success depends upon certain little niceties, which, as the result of some experience, he has ascertained. Now he may retain this method for his own use, and by so doing secure for a time the prestige of producing a charming speciality. It will of course be imitated with more or less skill by the limited circle of portraitists who chance to see specimens, each imitator having some time and material to waste before he secures the best result. But the general body of photographic portraitists gain nothing, and a charming style of portraiture is lost to the public at large. On the other hand, he may protect the method by letters patent, and by so doing find it remunerative to bring the method and the facilities for practising the method under the attention of every portraitist. The charge made enables him to do this, and so benefits the whole community. The total licence fee charged by Mr. Brown, as we are informed, is two guineas, not per annum, but for the entire run of the patent, and full instructions in the best mode of securing the best result is included in this charge. Now we can have no hesitation in saying that when the entire machinery involved in securing publicity, and the result to be gained, are considered, the charge bears very little comparison with the boon conferred. The impetus given to the smallest portrait business in the kingdom by adopting a really artistic novelty must far exceed the value of the licence fee. It is true there is "another way." Mr. Brown might have given this charming little novelty to the photographic public. He might, with rare magnanimity in a man of business, have given the improvement he had worked out for his own business to benefit his immediate competitors and rivals in business, and the photographic community generally. He might have written full instructions to the journals, and sent examples to the Editors for comment and description. We should be glad if every photographer would take such a course; but we are bound to confess that we scarcely think that the result would have been so beneficial to the public as the present. In the first place, that which is given away is too often regarded as unworthy of attention. One of the "copy-heads" of our school-boy days ran, "That which is easily gained, is lightly esteemed;" and many photographers would scarcely have given the matter a second thought. In the next place, the result requires to be seen in order to be appreciated, and by the agency of Messrs. Marion's travellers, and through examples supplied, that end can now be secured, which the gratuitous presentation of the process to the public would not have secured. Arguments in this direction might be multiplied, but it is no part of our province to assume the position of advocate in such cases. We might, indeed, in the first instance, had we conceived that such recommendation were needed, have announced that in case this enterprise on the part of Mr. Brown prove unsuccessful he will be the sole loser; whilst if it prove profitable the Photographers' Benevolent Association will prove the chief gainer, as a large portion of such profits are designed by Mr. Brown for that body.

Legitimate or not, however, there is little doubt that Mr. Bovey's statement on another page, to the effect that there exists in the minds of professional photographers a pugnacious antipathy against patented inventions, is to a large extent true. The announcement that a discovery or invention has been patented seems to operate on many like a red rag on a bull, arousing an unreasoning antagonism. In fact, we fear Mr. Bovey himself illustrates the case. He believes that very few of the patents connected with photography are worth the parchment upon which they are written. There, indeed, he is probably nearly correct; at any rate, there are not probably many more than half a dozen photographic patents the operation of which is maintained. This being so, still fewer of them can be intended as bogies to frighten the timid. Notwithstanding the strong feeling and fierce argument which have sprung up from time to time on the subject, photographers have not been seriously victimized by patent restrictions. The use of the carbon patent, to which Mr. Bovey makes especial reference, during many years was left open to the public without any charge for licence fee, and it has, if we are not misinformed, been much more extensively adopted amongst professional photographers of late, when a moderate fee is charged, than it has ever been before. We should remark, in passing, that in selecting that patent for illustration Mr. Bovey makes one or two errors regarding it. The patent was obtained in 1864, being sealed in the August of that year, not in 1863. He is under the impression that in Mr. Swan's original specification no claim was made for the manufacture of tissue; whilst, in fact, the first claim in the specification is for "the formation of tissues . . . of coloured gelatinous matter, so constructed that whilst they allow, in the act of printing, free access of light to one surface of the coloured gelatinous matter, they also allow free access of water . . . from the opposite surface, or back." Mr. Swan's original patent has little more than two years to run, but it will be quite time enough to cry out if it is maintained as a prohibitive bogey after the 27th of August of 1878.

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* Since this article was in type we have received several letters containing effects closely resembling those of Mr. Brown. To these and their bearing on the patent we shall refer in our next.—Ed.

Foolish patents in connection with almost every branch of industry are doubtless taken every year, many of them which could never be maintained if disputed in a court of law. Many such patents have been, and continue to be, taken in connection with photography, although, as we have said, photographers generally, in this country at least, have had a fortunate exemption from troublesome patent restrictions. Many patents have been taken for things useless, and many for things old and well known. But our readers must not be misled by the notion that a novel principle is necessary to the validity of a patent. A new thing must be produced, or an old thing in a new way; but the law does not concern itself about principles at all. Baron Alderson says:—"You cannot take out a patent for a principle;" and all the judges have dicta to the same effect. Novelty is undoubtedly an imperative condition, but it is novelty in result or in method. A new and improved thing, or a new and improved method, is the legitimate basis of a patent, and one legitimate touchstone of its soundness.

MODIFICATIONS IN PHOTO-COLLOGRAPHIC PRINTING.

BY L. VIDAL.*

As the very fine exhibition of photography at Paris proves beyond doubt that a very great progress has been accomplished in collographic printing, anything, ever so little as it may be, for the amelioration of that process, must be acceptable. This is why I come forward, believing that I shall render service to many in describing a simple means of retouching gelatine films from which photographic proofs are to be printed in fatty ink.

Those engaged in fatty ink printing from bichromated gelatine employ for that purpose patent plate-glass, and as soon as the proof is obtained on its surface they rarely attempt to modify it, so that if the image require a frame, a second operation, from a lithographic stone, is necessary in order to obtain it. The same operation is necessary if a signature, description, &c., is to be printed at the bottom of the page. It is very often found necessary to retouch the gelatine film in certain parts where details are absent, and in others where white spots are visible. I have succeeded in this by the employment of a chemical agent having the same peculiarity as light in the insolubilization of that organic matter in presence of a chromic salt.

I obtain this result with gallo-tannic acid, and even common ink containing a small quantity of tannin will do as well. After isolation, and even after the necessary washing, any design can be drawn upon the film; a signature, or anything else, can be written and then printed off without trouble. The surface of the glass is so flat and even that the most delicate design can be drawn upon it. This will be found of great value for the decoration of proofs with their frames, which can be drawn by hand around them. Typographic transfers can be obtained as easily as upon stone by employing a thin ink containing tannin.

In short, this process enables the operator to draw from a bichromated gelatine film either a view, portrait, photographic proof, or a linear design, signature, &c.; in fact, all that can be obtained from a lithographic stone, and, what is more, a photographic proof and a lithgraphic drawing can be obtained at the same time. Different tints and shades can be obtained by employing tannin in different degrees of concentration. This will give from a light grey to an intense black.

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Correspondence.

THE EDINBURGH SOCIETY AND MEDALS.

Sir,—I find a copy of a letter in your last number entitled "Edinburgh Medal Awards;" and as Mr. Williamson, in the said letter, does me the high honour to mention my name, allow me to make a few remarks on the said production.

Mr. Williamson introduces himself as "an amateur, who knows nothing, and desires to know nothing, of the unfortunate differences which have of late arisen in the society." This avowal of ignorance may serve as some excuse for the nature of his remarks, which abound in groundless insinuations and assertions, embodied in somewhat intemperate language; but it might have been more seemly if Mr. Williamson's ignorance had found a counterpart in Mr. Williamson's silence. At any rate, the utmost courtesy cannot admit that ignorance of a subject qualifies a man to speak about it.

Note these three points: First, his letter gives some strictures on your editorial remarks regarding the Edinburgh Society and medals, which of course one should be willing to receive as a specimen of brilliant criticism; but as you have made no remarks on these, I suppose you thought them not worthy of being noticed. Second, he says, "I attentively listened to Mr. Neilson. Imagine my surprise when I found, at the conclusion of a speech which most certainly contained but little of what he professes to give as the substance of it in your last number," &c. He here insinuates that my remarks, published as being *bona fide*, made at a meeting of the society, are not *bona fide*. One would have expected that a man of any candour, finding the apparent discrepancy alluded to, would have made some small inquiry on the subject, when he would have learned that my published remarks were not made at the meeting on the 3rd July, at which Mr. Williamson was present, but at a prior meeting on the 21st of June, at which he was not present. At that meeting I moved that there should be no medals; but finally agreed, for the sake of peace, to a compromise that there should be no local competition. Third, Mr. Williamson cannot see why, if competition is not allowed among members of the society, men from Timbuctoo should be allowed to compete. I beg to inform him that competition among the members is calculated to introduce discord in the society, which could not be introduced by his friends from Timbuctoo, however many medals they might obtain.

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* Communicated to the French Photographic Society.

The remarks of Mr. Williamson on these three points illustrate how, when a man is trying to say smart things, he may wholly overlook the consideration which is connected with being correct.

Mr. Williamson says that in my published remarks I talk sneeringly of the "well-drilled" opposition. Even in this he is mistaken. I did not use the expression sneeringly, but as stating a matter of fact, concerning which I must say a word or two. There has of late arisen in the society a very small party, bent on introducing medals at all hazards, and by any means; to which fact the records of the council can amply testify. Under the auspices of this small party, a number of faces, formerly unknown in the society, appeared at the meeting on the 3rd of July. Among the number was Mr. Williamson; for, though he may possibly have two or three times attended meetings, he was before the 3rd of July practically unknown as a member. I, who have regularly attended the monthly meetings, never heard of nor saw him before the 3rd of July. He says he received notice of "what was going on" (the meeting was to be held on Monday) late on Saturday; and as then, by his own account, he was entirely ignorant of the state of affairs, he was no doubt duly manipulated for the occasion by the gentleman who, when beating up for recruits, kindly called, on the said Saturday, to enlist and enlighten him. That the unknown men were "well-drilled" was established by the fact of their hooting and howling whenever any of the opposite party rose to speak, and repeating the same in chorus at every sentence. The hooting and howling were wholly confined to the unknown men and their worthy fugle-man. I admit that the other party used some strong language, but some allowance must be made in such circumstances: a man cannot be expected to be altogether cool and calm when he is persistently pelted with mud.

There are other statements in the letter which could not stand inspection; but as I am not an amateur, Mr. Williamson must excuse my not spending more time on him. I can merely say that the pert and flippant style suits well with the spirit of reckless assertion which pervades his epistle.

In concluding, one cannot help wondering a little that a man who glories in his ignorance of the subject at issue should thrust himself before the public as an authority.—I am yours, &c., W. Neilson.

Edinburgh July 15th.

PHOTOGRAPHY IN COLOURS.

Dear Sir,—On several occasions lately your pages have contained references to specimens of "photography in colours," and I fully endorse the remarks of your special correspondent when describing (page 302) the contributions of M. Leon Vidal to the Paris Photographic Exhibition. Assuming they are of the same character as those now being shown by this gentleman at the Kensington Scientific Exhibition, I consider that the description attached to them is calculated to mislead the general public into a belief that they are the legitimate results of a special photographic process, which reproduces colour by direct exposure in the camera, after the manner of Becquerel and Niepce de St. Victor. The twelve prints and two copies of paintings at South Kensington are labelled "Photochromie: Photographie en couleurs sans le secours du pinceau: Procédé Léon Vidal." The largest is a copy of tapestry work with blue ground, reproduced in a print measuring 21×15½ inches; next is a Pallissy dish, with brilliant colours in an oval of 20×15 inches; the other ten are smaller, and then come two glaring copies, 11×9 inches, which are supposed to be reproductions of paintings.

Now, I would ask, is it fair to show these as veritable specimens of photography in colours? The prints have all the appearance of being overlaid with pigments, and although, perhaps, obtained without the help of a pencil or brush, they are manifestly not "photographs in colours" in the true sense of that term, but rather coloured photographs or photo-lithographs printed in successive stages from coloured blocks. That they have misled the British public there cannot be a doubt; for I have myself frequently heard remarks passed upon them by visitors, clearly indicating the extraordinary character of the success supposed to have been achieved. A friend was examining them with me on one occasion when we heard a lucid account given of the difficulties overcome in the production of these prints, and how that they might be looked upon as marking a new era in practical photography. "Look at the Pallissy dish—how the green and mauve are reproduced! And these bright reds in the paintings—how wonderful!"

All this is, I fear, too good to be true; and it is a pity the exhibitor has adopted a description so worded as to admit of an erroneous impression being conveyed to the mind of the spectator who is but imperfectly acquainted with the present state of the photographic art.—I am, dear sir, yours truly, John Spiller.

ANOTHER NEW STYLE OF PORTRAITURE.

Dear Sir,—Much as I regret it, I must enter my protest against the attempt which is being made to prevent all members of the profession from introducing any style of doubly printed backgrounds in their pictures. What on earth there can be claimed of novelty or invention in double printing at this time of the day is a question which, were an attempt made at answering it, would probably puzzle any one to answer. We have had the American backgrounds, the Ford-Smith background, the Vanderweyde imitation stipple, and fifty others, but one and all nothing more than double printing, and for none of them have any patent rights been claimed. With regard to the particular effect which is obtained by photographing a piece of morocco leather or any other substance which will produce a granular effect, allow me to inform you that that very thing has been done, and, for aught I know, continues to be done, at Mr. Lafosse's studio in Manchester, where it came under my notice years ago.

That any one can pretend to novelty of invention in such a case is to my mind a puzzle; and my next inquiry is for a publication of the specification, which has not, as far as I am aware, been printed in your columns. I will only add one word, and it is suggested to me by your remarks upon the stagnant state of business with too many photographers. Might not this be the natural result of what has obtained too long, and might not the public begin to think that enough of these fading things—manufactured in cartloads—have been purchased, "too soon to be no more"?

What is really required to interest the public is novelty of a more sterling character than the modified or patched-up silver prints. Trusting that you will allow an old photographer to express his opinion, that it may elicit information, I am, your obedient servant,

Edward Collinson.

22, *Goldsmith Street, Newtham Park, Liverpool, July* 15.

[Mr. Brown's patent could not—as it is not intended to—interfere with the practice of double printing in backgrounds; its only aim is to protect this special design and method. As the specification is only just entered, it will not, in accordance with the arrangements of the Patent Office, be published, or accessible to the public, for six months. Regarding Mr. Lafosse, we think our correspondent must misunderstand the case in some way, for we understand that he is one of Mr. Brown's licensees.—Ed.]

Sir,—In a leader which appeared in the News of last week, I observe that a fresh bone of contention has been provided for the behoof of photographers, who in the present dulness of trade will probably accept as a boon the new material on offer, and which gives occasion for wading over grievances *de novo.* Rightly or wrongly, there exists in the minds of most professional photographers a pugnacious antipathy against patented inventions, and in the violent opposition they raise against the claims of each patentee as he appears in the scene, neglected merit has settled its outstanding claims which have for years been forgotten, in some instances existed unknown. As regards this new style of portraiture, invented and patented by Mr. Richard Brown, it recals to my mind a few lines lang syne written by Wordsworth :—

> "By happy chance we saw
> A two-fold image on a grassy bank :
> A snow-white ram, and in the crystal flood
> Another and the same "—

inasmuch as the charming novelty which Mr. Brown describes as mezzotint vignettes is a genuine facsimile of a style which has been produced before. If I mistake not, a method of imitating rough drawing paper has been published in one of the journals. At all events, as an eyewitness, I can vouch for the fact of Mr. Brown's system having been practised by a gentleman who some time since showed me some charming cartes that had been treated in a similar way, and the effect was a good imitation of prints produced in material possessing a rough texture. I cannot at this moment recal to mind the name of the gentleman referred to, but as the means he employed must have suggested themselves to others, we shall doubtless be shortly in possession of well authenticated proofs, which will convince Mr. Brown that his is by no means a novel invention.

Apropos of the question of patents, it is curious to note the multiplicity of arguments expended on the subject of patent laws. Now the conceded gist of the matter is contained in the fact that a very considerable proportion of patents are only substantial as bogies, designed to frighten the timid, who are impressed with an erroneous idea that all things called patent are, by the laws of old England, protected. The merest tyro in legal knowledge is, of course, aware that an absolutely novel principle must be embodied with every invention that bonâ fide can be protected by patent. More than this, the specification filed, in the description it gives, must not be written ambiguously, and no particulars that are essential to the complete working of the invention must be omitted. But except reference is made to the records contained in the archives of the Patent Office, few can with certainty decide whether the patent rights claimed, if otherwise genuine, have not been forfeited on account of the protection having run through its full term of years. Take, for example, Mr. Swan's patent taken out in 1863 : under that patent the Autotype Company claim for themselves the sole right of manufacturing carbon tissue, which in point of fact formed no part of Mr. Swan's original specification, and if it had done so the right would be forfeited (counting from the present time) in two years, except good cause can be shown for renewing the patent. Yet, in all probability, Swan's patent will for many years to come be held out to the photographic world as a prohibitive bogey. The fact of the matter is, there are very few patents connected with photography that are really worth the parchment on which they are written, because of the exhaustive researches engaged in by explorers who, unknown to each other, have experimented in a similar direction ; hence the reason why that so much of heart-burning is raised by the introduction of every new patent which claims a monopoly in the working of processes which others have a prior claim to, notwithstanding their having been, in solitary instances, kept a deep secret.

The only and true remedy for patents run rampant is for experimenting photographers to return to the old system of unselfish communicativeness. Experience has shown that, practically, the inventor who has given full particulars of his discoveries to the world has possessed the best chance of an unchallenged monopoly in his inventions, on account of the apathy of his fellows who read the tendered instructions, and are content to leave the matter untested because the process is theirs if they choose to enter on possession. It is the principle of prohibitiveness which excites combativeness and arouses the ire of photographers. And, in full truth, many so-called patents are based on modifications that would appear to be absolutely childish. Take Lambert's patent as a sample, wherein, under pains and penalties, photographers are warned that if they place tissue-paper on the sides of a negative they will be pounced upon by the strong arm of the law. And it is to be feared that we are to be favoured with another addition of those warnings in connection with this new style of portraiture, worked by a method which has been practised before by persons who, doubtless, considered the matter so trifling that they had but to circulate a few pictures and the photographic world at large would immediately discover the details that belonged to the secret. If Mr. Brown is wise, he will pause whilst there is yet time, and refrain from completing his patent. Let him present his process to the world, which course would spare him a great deal of unremunerative worry, which would, perhaps, be far worse than the ingratitude of photographers, who for benefits received rarely repay with a thank you. W. T. BOVEY.

SIR,—We have read your article on the "New Style of Portraiture" with great interest, and Mr. Brown's advertisements with astonishment, which is, doubtless, shared by many photographers. Last February, vignetted portraits, with grained or stippled background effects, were exhibited at the establishment of the Autotype Company in Rathbone Place ; and the instructions which Mons. Lambert gave to his pupils for the production of these pictures were identical with the method for which Mr. Brown has obtained provisional protection. Trusting you will publish this, we are, sir, yours faithfully,

July 17 HEATH & BULLINGHAM.

SIR,—In the PHOTOGRAPHIC NEWS of the 14th inst. I saw a picture described as "The New Portrait—the Mezzotint Vignette," and patented by Messrs. Brown and Barnes, of Liverpool ; also a leading article awarding great praise for the same.

I like everybody to receive praise when such is really due, also any remuneration they may be entitled to; but the picture described, and patented as new, is really not so. I, for one, have finished pictures in the same style five years ago, and so has Mr. Shroeder, of Grafton Street, Dublin, and, probably, others. I append a certificate from my assistant, who will explain to you that he saw one of the negatives eight months since, and asking what it was, I explained the "New Patent Mezzotint Vignette" to him.*

My mode of working was as follows: I produced a thin negative from drawing paper, sand paper, or other suitable subject, and after producing the vignette in the usual way, the print was exposed under this negative, and a tuft of cotton wool kept gently moving over the face and parts of the dress not required to be stippled, allowing the stipple to break gently into the vignetting. The whole thing suggested itself to me as a means of producing similar results to the Vander Weyde process.

I know very little about patent law, but shall think it very hard to pay £2 2s. for the right to produce a picture the same as I have been doing for the last five years, and should not have hesitated initiating any photographer who desired to become acquainted with the system.

It may be said that I am like many others, now the thing is patented and published, knew all about it ; but I have sufficient evidence to prove that I really did know all about it—and I am not alone—years before Messrs. Brown and Barnes thought about it. R. Perry, Staff-Sergeant,

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* The memorandum is enclosed.—ED.

Photographer to the School of Musketry.

THE MEZZOTINT VIGNETTE.

Dear Sir,—A few weeks ago you gave a very favourable mention in the News of a little novelty which we introduced from Paris, called "*Cliches Pelliculaires*," for printing in an ornamental margin to the cameo vignette. Whether or not we may trace to these the parentage of another novelty—patented by Messrs. Brown and Barnes, of Liverpool, under the above title—we do not know; but certainly the results are far more beautiful than any obtainable from the French *cliches*, both in artistic merit and delicacy of effect, and which render Messrs. Brown and Barnes' method worthy of the patent.—We are, dear sir, yours faithfully,

Southport, July 19. D. H. Cussons & Co.

THE PATENT IN GELATINE PELLICLE.

Sir,—Col. Wortley evidently takes me for a young man from the country by the commencement of his letter in last week's issue. I feel satisfied, however, that he is aware that I know the difference between *pellicle* and *emulsion*, although it does not, perhaps, suit his purpose to understand what I mean. In his former letter he would lead one to believe that Mr. Kennett knew nothing whatever of the gelatine emulsion until Mr. Johnson published his formulæ, and then he (Mr. Kennett) rushed off with it to the Patent Office six days after its publication. I think it will be seen that Col. Wortley has no grounds whatever on which to base such an assertion. He then asks the question, if Mr. Kennett knew that he was in possession of so valuable a process, why did he not make it known? I can answer that, knowing Mr. Kennett so well, it was simply because there are so many constantly ready to pooh-pooh every novelty that is published and given to the public, and I think that this tendency is the greatest bar to photographic progress at present in existence. I am also in a position to inform the Colonel that Mr. Kennett is now in possession, and has been for some time, of very valuable information relating to the collodion dry-plate process, which he is restrained from publishing by this cause. But I cannot see how that alters the fact in relation to his pellicle patent, whether Mr. Kennett chooses to publish such information or not. If he did publish it, all the reward he would probably get would be the usual pooh-pooh by the captious critics who now always seem ready for that kind of thing.

I am perfectly aware that part of the process is open to every one to practise for himself—that is, the *gelatine emulsion* pure and simple. Next comes the intermediate stage after the gelatine emulsion is formed. It is now poured out to set, or get so that when cold it can be handled like a stiff jelly. In this state all the soluble salts can be washed or soaked out in cold water; but if left to stand as the Colonel says, it will form a pellicle of itself; but if left to dry of itself, it would get mouldy, and decompose, and become useless. To form the perfect desiccated pellicle, the water it contains must be driven off by a certain amount of heat and dry air. Now this particular part is the subject of the patent, and the patent thus stands for gelatine desiccated pellicle for redissolving to form an emulsion. Before Mr. Kennett arrived at his last stage of desiccation he tried many things to try to keep it from going bad. You must excuse me going into the full details; but as I had many conversations with Mr. Kennett relating to this process, I could not see him attacked in the way Colonel Wortley has done, without telling all I know of the affair; and one is obliged to be so very explicit, for I have no wish to give offence to anyone interested in the patented or unpatented part of the invention; and I think, instead of finding fault and cavilling, it would be better to put the shoulder to the wheel, and make the process as perfect as possible.—I am, sir, yours truly, W. Brooks.

9, *Stratford Green, July* 18.

CAUTION TO PROVINCIAL PHOTOGRAPHERS.

Dear Sir,—I would caution provincial photographers against two men going about the country some twenty or thirty miles from London, visiting houses, asking permission to take the house and groups, mentioning the name of the local photographer as coming from him. It came to my knowledge last week that they went to a house and wanted to take a group of the servants. After a little persuading—my name being freely used—the plate was exposed, payment being demanded as soon as the negative was taken. Sight of a specimen print being asked, they said that they did not do business in that way; the quantity required was to be ordered and paid for immediately, and they were to come to me for a reference, which they did. I knew nothing of them, neither had I seen them.—Yours, &c., Richd. Huck.

Leatherhead.

Talk in the Studio.

Enamelling, Retouching, &c.—We have recently had placed under our attention, by Mons. Piquepé, a box of examples of the work of the Photo-Artists' Company, of which he is director. Of the brilliant albumenized paper and excellent printing we need say nothing here; the very perfect examples of enamelled surface, and the judicious and artistic quality of the negative retouching, demand a word of especial praise. The sample box in question is very complete: besides examples of retouching and of enamelling, it contains specimens of printing (single and double), of albumenized papers, of ornamental backgrounds, of diapers for such backgrounds, of masks, and other things.

Photographic Portraits with Borders.—M. C. Quesnay, of Lille, France, gives the following for producing in one printing a portrait combined with a border in any design, and in the same or two different tints. In taking the portrait, the glass is first cleaned, and treated with an ethereal solution of wax; it is then collodionized, sensitized, and exposed in the usual manner. Upon the ground glass of the camera an oval is traced of the exact size the portrait is required, and between the prepared plate and the shutter of the dark slide is fixed a mask, cut to the exact size of the oval upon the focussing glass. By this means the photograph is produced with a transparent border. After washing the negative, flow over it a fifteen-grain solution of gelatine to the depth of about one-twentieth of an inch, and set it aside to dry in a place free from dust. When quite dry, it is coated with ordinary transfer collodion, and strips of paper are gummed upon the borders; when the latter have become dry, the pellicular negative is detached from the glass by cutting round the edges with a sharp penknife. A second negative is then produced of the object or surface intended to be used as the ground for the border, a mask being employed in such a manner as to leave a transparent opening in the centre, the exact size of the portrait previously produced; the two negatives are then superimposed and printed from in the ordinary manner. If the background or border be required in a different tint, the print, upon removal from the frame, must be washed thoroughly to remove free silver. With a brush dipped in solution of hyposulphite of soda, go carefully over the portion representing the border, and again wash thoroughly. After toning, the portrait will have the usual purple or violet brown tone, while the border will be represented by a sepia tint. This plan may be modified by cutting out the portrait from the pellicular negative, and gumming it together with an open mask representing the pattern of the border, upon a piece of glass or mica, and proceeding as in the former case.—*Scientific American.*

Elastic Dammar Varnish for Photographs, etc.—An elastic flexible varnish for paper, which may be applied without previously sizing the article, may be prepared as follows: crush transparent and clear pieces of dammar into small grains; introduce a convenient quantity—say forty grains—into a flask, pour on it about six ounces of acetone, and expose the whole to a moderate temperature for about two weeks, frequently shaking. At the end of this time, pour off the clear saturated solution of dammar in acetone, and add, to every four parts of varnish, three parts of rather dense collodion; the two solutions are mixed by agitation, the resulting liquid allowed to settle, and preserved in well closed phials. This varnish is applied by means of a soft beaver hair pencil, in vertical lines At the first application it will appear as if the surface of the paper were covered with a thin white skin. As soon, however, as the varnish has become dry, it presents a clear shining surface. It should be applied in two or three layers. This varnish retains its gloss under all conditions of weather, and remains elastic; the latter quality adapts it especially to topographical crayon drawings and maps, as well as to photographs.—*Pharmazeutisches Centralhalle.*

Preparing Relief Blocks from Photographs.—A German process for getting surface blocks from photos., to be printed by letter-press process, is:—Take a piece of looking-glass about 2½ inches larger all round than the original, and pour on it, in the dark room, the result of 1 ounce bichromate of potash in 15 ounces water, put over a slow fire, and add gradually 2 ounces of fine gelatine. When dissolved and at boiling point, strain through a fine linen rag. The plate must be placed in a horizontal position. Spread all over with a fine broad brush. Give fresh layers till the film reaches about a line and a half thick. Let dry for two or three days, and keep from the light. Take a glass positive from the negative of the original; place the prepared plate in contact with it in the printing frame. Remove to the dark room; pour over tepid water till fully developed. Dry with filtering paper, paint over with glycerine, and wipe off also with filtering paper. Develop the relief upon the plate; its subsequent treat-need not be effected in the dark. To make the plaster mould, mix fine plaster of Paris with spring water in two vessels, to the consistence of oil in one, of thick cream in the other. Hold the plate in the hand, pour over it the thinner solution, tap the bottom of the plate gently with the hand to prevent air-bubbles. Place the plate horizontally upon the table, and pour the thicker solution over to a moderate height. Leave it to settle and dry for some 16½ hours. Cut away the thin edges of the gypsum with a knife. Separate the plaster mould gently from the relief plate. Pour stereo metal into the mould, and a printing plate will be the result. Rectify defects with fine-pointed tools in the plaster mould previously to casting.

Printing Bath.—M. D. Ratti, in the *Revista Fotographia*, gives the following as an economical printing bath, producing excellent results:—Nitrate of silver, 40 parts; nitrate of ammonia, 40 parts; white sugar, 40 parts; water, 1,000 parts. The best description of paper to use with this solution is one very lightly salted, about 2 parts of salt to 1,000 of albumen being the strength mentioned by the author; the toning and subsequent operations are the same as those in general use. After the solution has been once used, it is shaken up with ten drops of washed animal charcoal, which is allowed to remain in the bottle in order to keep it colourless. It is strengthened from time to time by the addition of a due quantity of similar solution, but containing two and a half times the proportion of silver.

Photo-Printing Plates.—Mr. J. Husnik employs the following formula for the production of engraved plates by means of photography. It is based upon the use of bichromatized gelatine, the necessary grain being given by chloride of calcium. The formula consists of gelatine, 24 parts; bichromate of ammonia, 4 parts; alcohol, 72 parts; chloride of calcium, 4 to 5 parts; water, 240 parts. This is spread upon glass, or other suitable support, and, after exposure and washing, is used for the production, by the galvanoplastic method, of a plate, from which the prints are pulled in the usual manner.

Waterproof Varnish for Paper, etc., is obtained by precipitating a solution of tallow or resin soap by aluminum, iron, or copper sulphate, and dissolving the precipitate in a liquid hydrocarbon, or in carbon-bisulphide.

The Silvering of Mirrors.—Down to the year 1840 the silvering of mirrors was performed by means of tin covered with mercury in a liquid bath. Such manipulation necessarily exposed the workmen to the pernicious influence of mercurial vapours, and many of them met with premature death, after long sufferings. In 1840, Drayton conceived the idea of covering mirrors with a thin pellicle of silver, obtained by reducing an ammoniacal solution of nitrate of silver, which moistened the mirror, with essential oils easily oxidised. Petitjean substituted tartaric acid for the various reducing agents previously employed. The mercury bath, with its attendant evils, is now suppressed. Even in point of cost the use of silver is preferable. A mirror is silvered in a few hours, whereas the old tinning process lasted twelve days at least. Still silvered mirrors have a yellow tint not met with in tinned ones, which is a serious defect in practical use. Moreover, the adherence of the silver to the glass is not so perfect as might be wished. It often happens that the silver leaf of mirrors exposed to the direct action of the sun's rays comes off the glass here and there Lastly, the silvering, though covered with a thick varnish, gets black in course of time under the influence of hydro-sulphuric emanations. The emanations which rise from the waterhold of ships in the equatorial regions turn the mirrors black that are stowed in them. These defects are more than compensated by the saving of expense and the prevention of the maladies caused by the use of mercury, but it was desirable that, if possible, they should be avoided, and M. Lenoir has succeeded in correcting them by a simple manipulation which is harmless to the workman. The mirror, silvered by any process whatever, is first washed, then sprinkled with a diluted solution of cyanide of mercury and cyanide of potassium. The silver displaces part of the mercury, and is dissolved. The rest of the silver gives rise to an amalgam whiter and more adherent to the glass than silver itself. This transformation is instantaneous. The proportion of mercury does not exceed five to six per cent. The management of the cyanides, which are very poisonous substances, does not give rise to any danger when they are in very diluted solution. The daily practice of electro-platers, who have used them for more than thirty years in much more concentrated solution than M. Lenoir does, has not occasioned any serious inconvenience.—*Practical Magazine.*

The Spectroscope a Witness in a Forgery Case.—A remarkably ingenious and novel application of the spectroscope as a witness in a case of alleged forgery, now on trial in this city, was recently made by Dr. P. H. Vander Weyde. A suit was brought to recover on a check a large sum of money from a bank which, the plaintiff alleged, had certified the document. The bank, in defence, claimed that the certification was a forgery, and among other statements asserted that the ink used was not the same as that employed on other checks certified by the same person on the same day. Dr. Vander Weyde was called as an expert witness to determine this point, and he appeared in court armed with a powerful microscope having a spectroscopic eyepiece. By carefully observing the spectrum of sunlight reflected from the surface of the paper covered with different inks, and then passed through the spectro-microscope, he previously had satisfied himself that all inks other than black—such as Prussian blue, carmine, aniline red, &c.—absorb certain parts of the solar spectrum, so that it would be a certain and easy way of recognizing the identity of the two inks to note the fact that both produced an absorption of, and so blotted out exactly similar parts of the solar spectrum. This, of course, was spectrum analysis produced otherwise than by examining the incandescent vapour of the substance, an obviously impracticable proceeding here. On the witness-stand Dr. Van der Weyde was given a variety of checks from the bank, together with the particular document on which the suit rested. The microscopic part of his instrument magnified the writing so highly that the dot on an i was sufficient for all purposes. The result was that the ink of the alleged forged signature and that of the bank's genuine writing gave exactly the same absorption spectrum, and hence were pronounced identical, and this although the check in suit had been handled and exposed to the light until the ink had faded considerably. —*Scientific American.*

Substitute for Gold-Bronze.—The meta-vanadic acid possesses properties which recommend it as a substitute for gold-bronze. With care it can easily be obtained of beautiful colour and lustre, almost equal to gold, and as a very fine powder, mixing readily with gum or oil. It is in no way affected by the atmosphere or by moisture.—*Chemical News.*

Lightning Figures.—Notwithstanding Professor Tomlin's repeated explanations that lightning figures are the natural irregular markings of the electric fluid on coming into contact with a non-conductor, we find statements in the press like the following:—A young man named George Boucr, while ploughing corn near Newark, Ohio, was struck by lightning and instantly killed. A bluish black discolouration of the body extended from the neck to the hips. On his breast was found engraven the likeness of a large tree which stood within a short distance, the branches of which projected naturally to each shoulder, forming a representation so perfect as to render the leaves plainly visible.

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To Correspondents.

Rode.—A trace of carbolic acid will aid materially in keeping albumen from decomposition, or a trace of salicylic acid (say a grain to half-a-dozen eggs) will answer, especially if kept in a well-corked bottle. 2. If you use the albumen very dilute (say one ounce in forty of water) there is not much danger of the bath getting out of order.

F. M. D.—We cannot mention the products of special makers by name in this column. If you send us a list of those you have in contemplation, with numbers attached, we will give you any special aid or information we can. 2. Your question as to the mode of taking negatives on paper is a little vague. There are several paper processes, such as the callotype and waxpaper processes, which are rarely practised now, having been superseded by collodion. The only paper process likely to come into practice at present is the sensitive pellicle on paper of Herr Warnerke. We have, in former volumes and Year-Books, described all the processes. If you will state to which process you refer, we will endeavour to aid you.

Rownlow.—The dirty yellow stains are due to the formation and decomposition of insoluble hyposulphite of silver, arising either from imperfect fixation, or, as their appearance suggests, the use of dirty dishes for rinsing the prints prior to toning. If a dish which has at some time contained a solution of hyposulphite of soda be used for rinsing prints before or after toning, but before fixing, such stains will generally arise; or if the prints before fixing be handled with fingers which have touched hypo the same result will arise. Fixing in an old or weak hypo bath will produce a similar result, as will also allowing the prints to stick together in the hypo bath. In all these cases hyposulphite of silver is formed, which, unlike the double hyposulphite of soda and silver, is insoluble in water, and is decomposed by the action of light, forming the dirty yellow stains of which your prints show examples.

R. Gordon.—A combination of causes produce the defects in the views sent. Primarily, the lens does not cover. A much smaller stop might help you; but it seems to us doubtful whether the lens in any case will do justice to a plate of the size. In the next place the subjects are not well lighted. There is no light and shade, but a uniform diffused light which can never yield a good picture. The collodion also seems to be new, and tends to give a thin image lacking intensity. Try a developer with half the proportion of the iron salt. Regarding the splitting of gelatine films referred to in our last, Mr. Kennett writes to us that it is blistering rather than splitting, and adds:—"This is often caused by using rain-water; spring or pump water generally stops this. The colder the water the better. I have often been written to about this, and always find rain-water has been the delinquent. Many have brought their plates to me to develop, and are quite astonished when they see me develop without any sign of blistering, more especially when I place the plate in the sink, and let the full force of twenty feet fall of water on them."

R. B.—In using collodio-chloride of silver for printing on glass, the use of citric acid or some equivalent substance is imperative to secure vigour; but on paper we have obtained good vigorous prints of the collodio-chloride with excess of free nitrate, and no citric acid or other addition. Whether on paper or glass, fuming adds vigour and richness. In printing on glass much free nitrate of silver should be avoided, as it is apt to crystallize on the dried plate. In our own practice we prefer to dry the plate by a dull fire, and place in contact with the negative whilst still warm. A weaker gold bath than is required for albumenized prints is desirable for toning collodio-chloride prints.

Focus.—Undoubtedly you may modify your lenses in various ways; but it is very doubtful indeed whether you can gain any advantage by doing so. As a rule, you may rely upon it that a lens sent out by a good maker is so mounted as to secure its maximum of advantages. By bringing the lenses closer together you shorten the focus and obtain more light, but you will spoil the marginal definition. A good lens is not improved by amateur "tinkering." With a bad lens there can be no harm in trying experiments.

Burnisher.—So far as our opportunities of examination enable us to form an opinion, we prefer No. 2.

A Printer.—You have not carefully read our description. There is no grain whatever, fine or coarse, in the face of the prints, all the important parts of the portraits, especially the flesh, being protected during the second printing. We have seen the backgrounds for double printing with a stipple, fine in the centre, and graduated to a coarser grain towards the edges; but the effect of the mezzotint vignettes is different. We cannot undertake to pronounce authoritatively on the validity of different patents; but as a new effect it appears to us to be patentable, unless some one can show that the same thing has been published before, or worked with sufficient publicity to constitute publishing. Showing that it has been done privately before will not affect the matter.

Mezzotint Vignettes.—Several letters on this subject have arrived too late for this week's issue. They will appear in our next.

J. Bullock.—Many thanks. In our next.

Several correspondents in our next.

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METEOROLOGICAL REPORT FOR JUNE.

BY WILLIAM HENRY WATSON, F.C.S., F.M.S.

Observations taken at Braystones, near Whitehaven,
36 *feet above sea-level.*

N.B. In this and former reports the barometric readings are given not reduced to sea level, and the readings of the thermometer were made in the shade.

Date.	Barometric Pressure.			Temperature			Direction of Wind at 9 a.m.	Remarks.
	Morning	Noon.	Night.	Morning	Noon.	Night.		
1	29·96	29·95	29·91	51°	60°	53°	S.W.	Fair and sunny
2	29·88	29·75	29·64	52	64	58	S.W.	Fair and sunny
3	29·50	29·41	29·41	58	63	48	S.W.	A little rain this afternoon
4	29·51	29·55	29·53	51	59	52	S.S.W.	Fair, but gloomy
5	29·35	29·50	29·68	54	61	50	S.W.	Fair, but gloomy
6	29·70	29·67	29·67	56	60	54	S.	Rain a.m. Gloomy all day.
7	29·68	29·72	29·72	54	60	53	S.	Fair, but gloomy
8	29·61	29·57	29·54	52	57	52	S.S.E.	Rain a.m. and p.m.
9	29·46	29·50	29·78	54	62	49	S.	Rain this evening
10	29·83	29·90	29·93	52	60	50	S.W.	Fair and sunny
11	29·90	29·86	29·84	53	65	52	W.S.W.	Fair and sunny
12	29·80	29·76	29·76	62	65	51	W.	Fair, but gloomy
13	29·76	29·73	29·73	50	63	56	S.W.	Rain this morning
14	29·72	29·70	29·60	54	64	51	W.	A little rain a.m. and p.m.
15	29·53	29·46	29·50	53·5	58	54	S.S.W.	Fair and sunny
16	29·50	29·52	29·54	54	60	53	S.W.	Fair, but gloomy
17	29·51	29·42	29·50	53	61	56	S.	Fair, generally sunny
18	29·60	29·72	29·78	52	63	53	S.	Rain a.m. and p.m.
19	29·80	29·86	29·90	58	65	58	S.	Fair and sunny. Windy
20	29·90	29·84	29·84	69·5	81	71	S.W.	Fair and sunny. Windy
21	29·79	29·71	29·80	75	82	57	S.S.E.	Thunder and lightning this evening, with heavy rain
22	29·90	29·94	29·90	60	62	57	N.	Fair and sunny
23	29·84	29·84	29·89	61	62	59·5	N.W.	Rain all day
24	29·90	—	29·94	68	—	56·5	S.W.	Fair and sunny
25	29·98	30·00	29·99	67	75	67	S.	Fair and sunny
26	29·94	29·94	29·99	69	76	64	S.W.	Fair and sunny
27	30·04	30·08	30·08	66	68	57·5	S.S.W.	Fair, generally sunny
28	30·04	30·02	29·98	61	64	55	S.S.W.	Fair and sunny
29	29·93	—	29·88	57	—	55	S.	Fair and sunny
30	29·82	29·80	29·80	60	65	59	S.W.	Gloomy all day. Rain at night

Summary.

	Mornings.	Noons.	Nights.
Maximum temperature observed	75°	82°	71°
Minimum ditto	50	57	48
Mean ditto	57·9	64·4	55·3
Mean of all observations	59·2		
Number of fair days			20
Days on which rain fell			10
Fair days sunny			15
Fair days gloomy			5

Notes.—On referring to the foregoing observations of the temperature it will be seen that on the 21st 83° was recorded in the shade at noon; at three o'clock p.m. on the 20th the same temperature was also reached. A thermometer exposed to the direct rays of the sun on the 20th registered 127°, and on the 21st 129°, the observations being taken at twelve o'clock. A thunder storm commenced at 5.30 p.m. on the 21st, preceded by rain, which lasted about half an hour; during this shower the temperature fell from 81° to 62°, a fall of 19°. The temperature recorded on the 21st was the highest I have observed here, my observations having commenced in the year 1870.

Braystones, near Whitehaven, July 10.

The Photographic News, July 28, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography and Art Schools—Photographic Fashion Plates.

Photography and Art Schools.—One of the most important aids that photography gives to education is undoubtedly the facility with which old engravings are reproduced by its means. The rare collection of engravings that have been gathered together at many of our own and foreign museums, and which represent the classics of this branch of art, are now capable of being copied with truth and fidelity, without which the copies would be almost valueless. Engravings made in the fourteenth, fifteenth, and sixteenth century are very rare, and, in some cases, the prints extant are simply unique. We have heard of students journeying a thousand miles, all the way to Munich, in order to enjoy an inspection of the grand collection of old prints that exist in the museums of that city, and remaining months and even years from home to copy from pictures which could not be seen elsewhere. The works of Albrecht Dürer, for instance, a few years ago could not be sufficiently studied in England; and it is so with the productions of other world-renowned artists, so that a costly and tedious journey is often necessary to make the student acquainted with the works of those old masters. As far as the matter of engraving is concerned, every day we are growing more independent of travel, for Munich some time back set the example of having as many as possible of her art treasures reproduced by the aid of photography. Gallery after gallery has been ranged before the camera, and now there is to be purchased a most complete collection of the pictures, cartoons, and engravings that have been gathered together in that art-loving city. It is in the case of old engravings, however, that photography has been most successful, and some of the reproductions are so fine and vigorous as to be undistinguishable from the originals, except in respect to their being impressed upon fresher paper. The are produced for the most part by the aid of a photo-lithographic process, and as they are reduced at the same time to a handy size, there is little difficulty in transporting or preserving them. Instead, therefore, of the student having to undertake an expensive journey to a foreign capital, there to demand permission to copy and study the rare drawings collected together, he is now rapidly growing independent of such a course, and in many instances can purchase and have in his own possession a sketch, which some time ago would have cost him many pounds to get a mere glance of. For a shilling or two he is enabled to secure for himself a reprint of one of the old masters of engraving, so that he can study it at home at his leisure, just when he likes, without demanding any one's permission, or going beyond the limits of his own doorway. The magnificent cartoons and masterpieces in painting in foreign museums are also, as our readers know very well, reproduced in the same way, but it is in the matter of engravings and etchings that photography has been the most successful in giving aid to the art student.

Photographic Fashion Plates.—Many tradesmen have resort to photography nowadays to make known their wares, instead of forwarding to their customers elaborate woodcuts of the same; but till the other day we had not seen any attempt to employ the art as a means of displaying the fashions. A number of cards showing the hats and bonnets of the season to be worn by ladies at the seaside or in hunting, or morning costume, recently came under our notice, which deserves a passing notice, if only from the circumstance that they illustrated a clever idea well carried out. The bonnet or hat was worn by a comely model, and thus not only was the effect of the head-dress favourably shown, but the manner of arranging the hair suitble to the particular bonnet or hat was also apparent Thus, a lady viewing the series of pictures sent to her, perhaps, at a distance of a hundred miles or so, would be able to choose any head-dress she desired, and get a hint also as to the manner of arranging the hair. No lady likes purchasing a bonnet or hat without doing a fair amount of "shopping" and "trying on;" and when at a distance from town, the looking over of such pictures as these must be some alleviation of the disappointment she feels at being unable to pursue her favourite pastime. As it is actually the hat and bonnet that is photographed upon a young woman's head, there is naturally far more reliance to be placed upon the picture than could ever be put on a painted woodcut; and hence any purchase made upon the strength of a photograph would be more likely to give satisfaction than a bargain based upon any chromo-lithograph drawn by hand. We know so little about fashion in ladies' costumes, that we rather hesitate to give an opinion on the subject; but we should think that if this idea were carried out still further, and the dictators on the subject of dress and toilette, whoever they may be, were to issue their fashion plates in future produced by photography, ladies would be very much the gainers. Suitable models could soon be found, and those dressed in accordance with the latest fashion, might be photographed. A camera picture would show the folds and indicate what the set of a costume should be far better than the florid paintings at present published, and we doubt not that, coupled with proper directions, dressmakers would more readily understand what was expected of them. The question of colour would scarcely enter into the matter at all, for the tints that upon fashion plates are simply given as indications, and little else. And while we are on the subject, there is no reason why such photographic fashion cards should be confined to those of the fair sex; man, too, might derive more satisfaction from seeing a picture of a human being clothed in accordance with general usage rather than be referred to Toots-like figures with waspish waists and impossible legs, to give him an idea of a new suit. And here we will leave this interesting subject.

FRENCH CORRESPONDENCE.

Exhibition of Photo-Chromes—M. Vidal's Productions and the Paris Exhibition—Photographs of the Paris Opera House—Photography and Justice.

Since Monday last the Parisian public have been admitted to an exhibition of a very novel character—one, namely, connected with photo-chromie. My readers are aware that the administration of the *Moniteur Universel*, to which belongs a large number of periodical publications, has taken in hand both the artistic and industrial working of M. Leon Vidal's process, and for the past year the workshops devoted to this class of work have been extended from time to time, while the machinery and *personnel* of the establishment have also been augmented. It has been impossible hitherto, owing to the press of work, to admit the public to view the productions obtained by the company; the latter have now taken a house in the vicinity of their works, and here a public exhibition of photo-chromic work has been inaugurated.

The exhibition consists of four rooms on the first floor, lightened by magnificent windows looking on to the Seine and the Tuileries. The first room is exclusively consecrated to pictures in black and white, produced by fatty ink printing by machinery; the process employed is one that has been much improved by M. Vidal. The frames that hang upon the walls in this department enclose, we may fairly say, the most beautiful results that have till now been obtained by this particular method of printing. There are no engravings or sketches executed by the most skilful artists, in their efforts to reproduce nature, which can vie in all their details with the results from the magnificent clichés here shown, the work of M. Bisson jeune, the principal photographer of the establishment.

What strikes the visitor most forcibly is, however, the circumstance that those beautiful impressions have been produced by the aid of steam machinery, and consequently by the thousand.

Two other apartments are filled with frames full of photo-chromic images. The effect is such that one appears to be in a picture gallery. All kinds of pictures are represented, from reproductions of the old masters to portraits taken direct from nature. There are copies of works in bronze, porcelain, enamel, metal, stone, copies of old faded paintings and of freshly covered canvases, which have just figured in the Fine Arts Exhibition. All have been reproduced with such fidelity, that one cannot help thinking it is the originals that are before one's eyes, whether objects or paintings.

The opening of this exhibition to the public gratuitously is quite an event, not only so far as photographers are concerned, but for the general public, and I heartily recommend such of my readers as may be in Paris to pay a visit to the establishment. It is to be a permanent exhibition, in which all photo-chromic works, as they are produced, will be shown, so that the collection will always possess the charm of novelty.

In reference to this subject, permit me to say how much I was surprised to read what has appeared in the Photographic News of the 30th of June (page 302), in reference to the photo-chromes exhibited at the Palais de l'Industrie by M. Leon Vidal. The author of the article in question speaks of certain "green pamphlets lying near the coloured photographs," and destined, according to him, to deceive the visitor by causing the latter to believe that M. Vidal has succeeded in fixing natural colours in the camera. I absolutely protest, in the name of my honourable compatriot, against this accusation, and in support of my protest I send you the two pamphlets of which the correspondent of the Photographic News makes mention. The first, entitled "Photo-chromie," is the reprint of an article published in the "Moniteur Universel" by Paul de St.Victor. The second is a letter written by an amateur, under the title of "Helio-chromie et Photo-chromie," to prove precisely that "for the moment there exists no means of printing directly images in their exact colours."

M. Vidal himself has always insisted upon this point in all that he has written upon his process. It is, therefore, perfectly unjust to accuse him of deceiving the public.

As to the novelty of M. Vidal's process, I should like to know how it is, if that gentleman cannot claim it, as the correspondent of the Photographic News affirms, that nobody has shown such productions before; or if they have, how is it that an invention has not been worked in an industrial manner, which, in the hands of M. Vidal, gives the fine and numerous results that are so well appreciated by the public?

I have just had an opportunity of seeing some very fine stereoscopic slides representing the famous staircase of the new opera, and several other portions of that splendid edifice, obtained by M. G. Levy, with the aid of electric light. The lamp employed for illuminating purposes was that of M. Dubosq.

In regarding these fine pictures, and the manner in which they were produced, one cannot help regretting that the same plan of photographing was not adopted recently by the police in a cause célèbre that has attracted general attention. I refer to the crime in the Bois Colombes. A woman having disappeared, it was discovered that she had been killed and buried in a cellar by a mason with whom she had been living. While avowing himself to be the cause of her death, the man pretended that he had had a dispute with his victim on the stairs, and that he had simply given her a push, the result of which was that she broke her neck in falling. The body was exhumed, but instead of photographing the remains a sketch was made, in which the woman was represented naked. A second sketch, however, made by the police from memory, shows the body to be clad. Now the question naturally arises, which of the two sketches is true? and as this turns on a matter of life or death, the point is important. If the body was clothed, then the statement of the prisoner may be admitted, and the crime amounts to but homicide. If the body was naked, there is much evidence to show that a foul murder has been committed. The man has been condemned to death on the faith of the first sketch; who knows but what photography might not have saved him?

This circumstance is sufficient to show what aid justice may derive from the application of photography, and certainly it behoves our laws to take advantage of any assistance that stands at their disposal. Ernest Lacan.

NOTES ON PHOTOGRAPHY, HISTORIC AND DESCRIPTIVE.

BY CAPT. ABNEY R.E., F.R.S.*

I daresay that many of you may have been charmed with the production of magic photographs, as they were called. Some few years ago the sale of such was enormous, but now the curiosity of the public seems to be satiated. The magic, as you may be aware, consisted in being able to produce on a white piece of paper a photograph of some unknown object. These mysterious pieces of paper were generally supplied in packets, containing with them a piece of blotting-paper. The directions stated that the blotting-paper was to be damped, and, whilst moist, to be applied to the surface of one of the accompanying pieces of blank paper, and then a photograph would shoot out. I will endeavour to show you one method of their production. Here I have an ordinary photographic print which has not been treated with gold, but merely immersed in sodium hyposulphite, and then washed. I immerse it in a solution of mercurous chloride, which I have in this dish, and immediately a bleaching action is set up. The action continues, and the paper is apparently blank. What has happened? Simply a white compound of silver and mercury has been formed, which is indistinguishable from the paper. If I wash the paper, and dry it, it is in the state of the paper supplied in the packets. I have one here washed and dried, and I immerse it in the sodium hyposulphite. The image immediately reappears: a combination has taken place between the constituents of the hyposulphide, the mercury, and the silver.

Need I say that the blotting-paper supplied is impregnated with the same sodium salt? In damping it the molecules of the latter are so separated and mobile, that they are free to combine with the white image. By similar treatment the picture may be made to again disappear and once more reappear.

Besides silver there are various other metals which will give a photographic image. This paper, which has a slightly yellow tint, has been brushed over with ferric chloride, more commonly known as perchloride of iron, in which we have the maximum number of colours of chlorine combined with metallic iron. Allowing ordinary white light to act upon it, the waves cause a disturbance between the iron and the chlorine atoms, and one of the latter is shaken off, leaving ordinary ferrous chloride, or muriate of iron, behind. A piece of paper, similarly prepared, has been exposed beneath a negative, and the reduction of the ferric chloride to the ferrous state can be demonstrated by floating it on a solution of potassium ferricyanide. The combination between the lowest type of the iron salt and this salt results in the formation of a deep blue precipitate known as Turnbull's blue. You see, after applying it, we have the lines of this map, of which this is the negative, of an intense blue. Instead of demonstrating the change of the iron salt by this means, I may float it on a weak solution of silver nitrate. The ferrous salt of iron will reduce the silver, whilst the ferric salts are wholly inoperative to produce the same effect Here we have such a print.

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* *Nature*. Continued from page 341.

The principal investigator of the action of light on iron compounds was Sir John Herschel, and he employed a variety of different combinations. Perhaps one of the most interesting exhibits in the Photographic Section is that old list of Fellows of the Royal Society, on which were pasted, by the hand of that distinguished philosopher, the actual solar spectrum prints made during his researches on these and other metallic salts.

Uranium salts are also capable of being reduced to less complex forms by the action of light. I will not enter into a detailed description of the decomposition, but will simply exhibit the method of producing a print with the salt. The paper has been coated with uranic nitrate and exposed to light beneath the same negative before shown to you. The image is made visible by a solution of potassium ferricyanide, as in the case of the iron salt.

In the cases of photographs are shown some interesting specimens of iron and uranium prints made by Niépce de St. Victor. I believe they were presented to Sir Charles Wheatstone by that ardent experimentalist. The subdued brown tones of the latter were probably obtained by the admixture of a little iron with the uranium.

Within the last couple of years the salts of iron have been put to practical photographic printing purposes by Mr. W. Willis, jun., of Birmingham, and a valuable process has resulted from his labours. The sensitive salt employed is an organic salt of iron known as ferric oxalate, and Mr. Willis made the discovery that amongst other metals platinum could be reduced to the metallic state from a double chloride of potassium and platinum by ferrous oxalate in the presence of a potassic oxalate. A piece of paper is floated on a weak solution of silver nitrate and dried; and over the surface is brushed a mixture of the platinum salt and the ferric oxalate. After exposure to light (which produces the ferrous salts) beneath a negative, the paper is floated on a solution of neutral potassium oxalate, when the image at once appears formed of platinum black, a substance at once durable and incapable of being acted upon by atmospheric influence. Such an exposed paper I have here, and floating it on oxalate solution, you see the image is immediately developed. The unreduced iron salt can be eliminated by soaking the print in the oxalate solution, and a rinse and hyposulphite removes all traces of silver nitrate. After a few changes of water, the print may be dried, and is permanent. I should explain that the paper is first coated with silver nitrate in order to cause the platinum to adhere firmly to the surface of the paper. When omitted, the fine black powder formed is apt to precipitate in the bath.

Before dwelling upon that metallic compound which in photography is next in importance to silver, I must call your attention to the first vanadium print ever produced. Prof. Roscoe, who has already delighted an audience in this room with an admirable lecture on Dalton's apparatus and what he did with it, has made a classical investigation of the compounds of this metal, and, amongst other interesting facts, has noticed that the vanadium salts are reduced by light in a somewhat similar manner to the uranium salts.

We now have to consider the printing processes which are due to the action of light on the dichromates of the alkalies in the presence of organic matter. For our purpose to-night we may take as a type potassium dichromate, a salt which readily parts with its oxygen to those compounds that have an avidity for it, more especially to certain carbon compounds under the influence of the ether waves.

To show that this salt is thus easily reducible by light in the presence of organic matter, I have here a piece of paper which has been brushed over with it, and exposed beneath a print. For a moment I float it on a weak solution of silver nitrate. The brilliant crimson colour of the part not exposed to light tells us that silver dichromate has been formed, but where the solar rays have acted the colour remains unchanged. A slight modification of this process now exhibited to you is known as the chromatype, the offspring of Mr. Robert Hunt, so well known in the scientific world for his researches on light. Whilst experimenting with the chromatype process, Mr. W. Willis, the father of the gentleman I have already mentioned, discovered what is known as the aniline process. It is based on the fact that an acid in the presence of potassium dichromate strikes a blackish green or red colour when brought in contact with aniline. You will see the *modus operandi* when I say that paper is floated with potassium dichromate and a trace of phosphoric acid. Aniline is dissolved in spirits of wine, and the mixed vapours allowed to come in contact with the sensitive paper that has been exposed beneath a positive print, such as a map or plan. The impact of the light has so changed the potassium salt, that the aniline vapour causes but little colouration, whilst where the paper has been protected from it, the dark colour indicates that the dichromate is unchanged. The formation of this black colour is familiar to the manufacturers of aniline colours, being, I believe, similar in composition to the residue left after the formation of aniline purple by Mr. Perkins' method.

It should be noted that for copying engineers' tracings and drawings, this process is extremely valuable, as there is no occasion to take a negative on glass before obtaining a print. All that is requisite is that the original should be fairly penetrable by light. A piece of paper prepared as indicated, a sheet of glass to place over the plan, and a box in which to place the exposed print to the aniline vapour, are the only necessary plant for the reproduction of a design. (*To be continued.*)

UPON IODIZING COLLODION.

BY DR. JOSEF MARIA EDER.*

My experiments lead me to the following conclusions, which may be taken as general:—

1. Collodions, when required to keep a long time, are most sensitive when they contain double iodides of ammonium-cadmium and simple bromide of ammonium-cadmium, or when they have ammonium or cadmium salts in proportion to these double salts; if the amount of cadmium salt is increased, then, as a series of experiments has abundantly proved, you gain in the keeping quality of collodion, but not in any degree proportionate to the loss of sensitiveness. The addition of ammonium salts increases the sensitiveness at the cost of the durability, equal to about one-fifth.

2. A proportionately small excess of iodide of ammonium makes the collodion one-fifth to one-sixth more sensitive, but less durable, as the free iodide of ammonium is liable to much more rapid decomposition in such collodion than in that in which the iodide of cadmium has been formed into a double salt.

3. A larger addition of free iodide of ammonium does not render the collodion apparently more sensitive than a less quantity, but the collodion decreases in stability the more iodide of ammonium it contains.

4. The excess of iodide of ammonium should not be added in its free state, but bromide of ammonium and double iodide of ammonium-cadmium should be employed, to prevent the use of the less stable iodide of ammonium, when by the formation of bromide of ammonium-cadmium, iodide of ammonium is set free. This is only to be done in the case of collodions which contain much iodide in proportion to bromine—to wit, portrait collodions—as the employment of much bromide of ammonium sets a great deal of iodide of ammonium free, causing the collodion to be more liable to decomposition. Landscape collodion, which is rich in bromine, should be produced by means of iodine and bromine double salts alone. For collodions which only contain bromine, the simple bromide of ammonium-cadmium is particularly suitable.

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* Concluded from page 320.

It may be interesting to some if I mention more in detail the mode of preparing double salt collodions which has been followed by Captain Toth and myself with the best results. We employ a collodion which, according to Vogel's experiments, has the best proportions of bromine and iodine, viz., one part of the former to five of the latter.

In 50 cub. cents of absolute alcohol are dissolved 2·8 grammes of double iodide of ammonium-cadmium and 0·4 grammes of simple bromide of ammonium-cadmium. Seven parts by weight of the iodine double salt and one part by weight of the bromine double salt approach very nearly to the desired proportions of 5 atoms iodine and one atom bromine. The solution is very rapidly brought about. One volume of this is mixed with 3 volumes of a 2 per cent. normal collodion, thoroughly shaken, and is ready for use in 12 to 24 hours. According to the quality of the cotton, the collodion assumes a darker or lighter yellow tint, which colour does not increase in intensity after keeping any length of time. It will keep good for any period, yields very fine negatives, and is to be especially recommended where the question of sensitiveness is not allowed to interfere with the durability of a collodion. I may remark that the sensitiveness of this collodion is by no means to be under-estimated, and assert that it is far more sensitive than one treated with cadmium salts only; neither is it so syrupy as the latter, but is scarcely to be distinguished from normal collodion as regards its consistence. It is particularly suitable for reproductions, and very good for portraits, many of the portrait collodions in general use being no more sensitive than this.

Landscape collodions are best prepared with this double salt, but then the proportion of bromine is, as a matter of course, increased. By way of example of an excellent collodion which, besides the double salts, contains also free iodide of ammonium, I may mention the mixed double salts collodion. It is the same as the foregoing as regards the proportion of bromine and iodine it contains: In 50 cubic centimetres of absolute alcohol are dissolved 2·8 grammes of double iodide of ammonium-cadmium and 0·3 grammes of bromide of ammonium; and one volume of the filtered liquid is thus mixed with two volumes of 2 per cent. normal collodion. This collodion will be found to possess a maximum of sensitiveness so far as it can be secured by the quality of the iodising salts, and by the favourable proportion of ammonium to cadmium salts. The collodion is particularly suitable for portraiture, but is a little less durable than the previous one; it may, however, be kept for several months.

In my investigation upon the iodizing of collodion, the question forced itself upon me, whether the maximum dose of iodide and bromide added to the collodion depended at all upon the nature of the salts employed, or whether, so long as the proper amount of iodine and bromine are present, it is immaterial with what metals they are combined.

To determine this, experiments were made with 1½ per cent. collodion—that is to say, with iodized collodion containing 1½ per cent. of pyroxyline. To produce all the undermentioned samples, 2 per cent. collodion was employed to which ⅓ of its volume of absolute alcohol was added, in which the iodine and bromine salt had been dissolved. In this way 1½ per cent. collodion was secured, which contained double iodide of ammonium-cadmium and the simple bromide of ammonium-cadmium in the proportion of one atom of bromine and five atoms of iodine.

A series of samples were prepared containing, of the ammonium double salts:

1·3 per cent. 1·5 per cent. 1·7 per cent. 1·9 per cent.
2 per cent.

Other samples were prepared with the proper amount of sodium-cadmium salts, to give one atom of bromine to five atoms of iodine. These contained of sodium double salts

2·0 per cent. 2·2 per cent. 2·4 per cent.

Potassium double salts could not be employed by reason of the unfavourable behaviour of the bromine compounds. To compare the results better, I iodized some samples of collodion with cadmium salts only (one atom bromine to five atoms iodine) in the following proportions:

2·0 per cent. 2·2 per cent. 2·4 per cent.

A comparative trial of the collodions, employing for the purpose a ten per cent. silver bath, showed that the maximum amount of sensitizing salts that collodion should contain was:

Of the ammonium double salts ...	2·0 per cent.
Sodium double salts	2·5 ,,
Cadmium salts	2·2 ,,

So that collodion with the above percentage of iodizing salts, and containing 1½ per cent. of pyroxiline, cannot be more strongly iodized in order to give good films after sensitizing. If the collodion has even the least quantity more of iodizing salt added to it, it betrays streaks, and shows all the symptoms of having been over-iodized. Collodions which contain little iodizing salt yield very beautiful, but very thin, films.

If these maximum figures are studied, it will be found that they represent nearly all the same amount of iodine and bromine, and from this it may be inferred that the quality of the iodine and bromine salts has no influence upon the limit of iodizing salt to be used, provided that the salts are soluble to a sufficient degree, but that this limit depends entirely upon the amount of bromine and iodine that is present in the collodion.

If a very strongly-iodized collodion is desired, one that will work hard and dense, it is well not to use a larger amount of salt than is specified in the above tables. 3·4 grammes of iodide of ammonium-cadmium and 0·5 grammes of bromide of ammonium cadmium, dissolved in 50 cubic cents. of alcohol, and the solution mixed with three times its volume of 2 per cent. normal collodion, gives a material which is sufficiently removed from the maximum limit of the iodizing salts; a collodion sensitized with a similar quantity of cadmium salts is disagreeably thick.

In conclusion, I may mention that Captain Toth and myself have produced a very large number of successful portraits and reproductions by the aid of collodions sensitized with double salts, which leave no doubt as to their value.

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THE PORCELAIN PICTURE.

BY AN ADEPT.*

I desire to say a few things about making the so-called porcelain picture. There are two ways of making this beautiful print; the one with the copying camera, and the other with the porcelain printing frame. The copying camera, therefore, first claims our attention.

Copying Camera.—You can obtain very excellent copying cameras, ready in every respect, from the stockdealers; or you can easily make one yourself. In the first place, ascertain the focal length of the lens you intend to use for this purpose; this you do approximatively by measuring the distance between its burning-point and the middle of the brass tube that contains the combinations of glasses that make the lens. We will suppose this distance to be eight inches, and, furthermore, that you have a camera to which the lens is already attached. Construct a box of about thirty-two inches in length, namely, with a bottom and two sides of such dimensions as to allow your camera to slide accurately on the bottom and in contact with the sides and the upper lid, which latter is only twenty inches in length; this lid covers the top of the box under which the lens slides and is adjusted on hinges. The end of this box in front of the lens is so arranged as to receive a set of shields or plateholders from the four-fourth size downwards to the one-sixth plate, or to whatever size you require; each shield is fixed in its place by means of metallic springs or rotating buttons; and the negative is fixed in the shield in a similar manner. If you have a convenient and unobstructed view of the north side of your gallery, you can place this compound box so that the negative receives its light from the north; in such a case the box can be supported on the window-sill or on a table in this position. But as a general rule I think it the best plan to receive the light from the skylight, and then by means of a side reflector, to transmit it in a horizontal direction through the negative and the lens. In this way you can get the softest and most uniform illumination. The reflector to produce the result in question is fixed in front of the negative on hinges at the bottom of the box, and, consequently, opens downwards; it consists of a plate of glass in a frame like a school slate; on the under side of the glass a quantity of gypsum, mixed into a cream with water, is poured, and allowed to concrete; when dry it may be backed with a piece of strong pasteboard or thin wood. When the reflector is lowered on its hinges so as to be inclined at an angle of forty-five degrees with the surface of the negative, it is evident that the light from the skylight will be reflected perpendicularly upon the negative, and, furthermore, it will be white and homogeneous. The negative to be copied on the porcelain plate is fixed in the shield wrong side up, and with the collodion looking to the lens. I must remark here, that the negative which is suited for such sort of work must be very thin, transparent, and yet full of detail: it must be much thinner in the opaque parts than an ordinary negative for paper prints; and it is well not even to varnish the negative, because a layer of varnish is apt to detract from the transparency of the film, or to leave small particles of opaque matter on its surface.

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* *Photographic Times.*

Most generally the picture is required to be of the same size as that on the negative; therefore slide the camera under the lid until the middle of the lens is about sixteen inches from the negative, and focus the negative on the ground-glass by removing the bellows part of the camera. If the picture on the ground-glass is now of the same size as that on the negative, no further adjustment is needed; but if it is larger, then draw the whole camera (not the bellows part) a little back and focus and measure again. If, on the contrary, the picture on the ground-glass were larger than that on the negative, you must slide the camera forwards to the front. As soon as the exact position is once found where the two pictures are of the same size, the camera is fixed or clamped in this position; and a mark is made by means of which the camera can again be placed in the same position if it should be removed for other purposes.

The porcelain plates are prepared for the reception of the collodion precisely in the same manner as common glass, that is, the edges are first filed or ground off, and the plates are then carefully washed and coated with dilute albumen.

It is advisable to use a rather new collodion, carefully filtered, and perhaps less consistent than negative collodion; five grains of pyroxylin to the ounce will be sufficient, and the bromo-iodizer may consist of three and a half grains of iodide of ammonium to two and a half grains of bromide of cadmium to half an ounce of ether and half an ounce of alcohol. Your ether must be concentrated and free from acidity, otherwise the collodion soon becomes red; and the collodion must be concentrated too, otherwise the collodion will form a reticulated film as it dries. (Much of the alcohol which is sold now-a-days as being 95 per cent. strong, seldom exceeds 85 per cent., and the ether is frequently both dilute and acid. Get your stock of these articles from responsible houses, and not from the drug stores, where most generally you obtain them of the quality about which I complain. Furthermore, learn to test them yourself.)

The same exposure is required for a good porcelain picture as for a good negative; and in both cases an over exposure is preferable to an under exposure, because you can control the development in the first place, but cannot bring out the picture by any sort of forcing in the second case.

You will do well to have two baths for sensitizing the plates, one of the usual strength, and the other, into which the plate is dipped when sensitized, containing not more than ten grains of nitrate of silver to the ounce of water; and I would recommend you also to allow the plate to drain completely before you proceed to the development. You can use the iron developer, the nitro-gelatin, or the ordinary, but in both cases it must be filtered and recently prepared. Much depends in this process in having all your solutions perfectly clean, pure, and of the best quality. The picture comes out gradually when the developer is poured on; and the development is stopped by washing, when the intensity of the shades is a little beyond what you require in the finished picture. It unfortunately happens, somewhat frequently, that the whites of the picture become stained with silver, even in places where the light has not acted. The only remedy appears to be extreme care in cleanliness and manipulation. Wash thoroughly, and then proceed and fix the picture, unless there happen to be stains of silver on the portrait itself. In this case it is better and easier to make a new picture than to attempt to remove the stains; if the latter appear only on the background, and especially at some distance from the picture, you can easily remove them after fixation. Use *fresh* hyposulphite solution for each print. Wash thoroughly after the plate is fixed, and then examine it in broad daylight. Now is the time to remove any little stain on the white background that mars the beauty of the picture. For this purpose mix in a small vial one drachm of nitric acid and seven drachms of water; place quite conveniently a beaker full of water ready to be poured on the plate the moment it is needed. Now pour some of the acid solution on the stain, and incline the plate so that the fluid may fall from the portrait and not towards it; if by accident the acid runs towards the picture and gives signs of encroaching upon it, immediately wash it off and begin again. By this proceeding all stains can be thoroughly removed, after which the plate is again carefully washed.

Toning of the Porcelain Picture.—In its present condition the porcelain print is not agreeable in its tone, being of an ill-defined, greyish hue; but this is easily remedied. Dissolve fifteen grains of chloride of gold in two ounces of water, and of this solution take one drachm to two ounces of water for present use. Pour this solution over the picture until the tone is just uniformly changed into one of a slight rosy hue, but no more. Wash again. Keep in stock a saturated solution of bichloride of mercury, and for present use take one drachm of the same and mix it with one ounce of water. Pour this solution over the gold tone, which will soon change to a bright purple-black, giving much brilliancy to the picture. This operation is very critical, and you have to guard against proceeding too far, for then the tone recedes, and then becomes gradually whiter and whiter. It is absolutely necessary to stop before the retrograde motion sets in. The tone once gained, the plate must be washed immediately in order to remove every trace of mercury. The picture now will be handsome and brilliant, and of a warm black tone, which mercury alone cannot produce; it partakes of the tone which is produced when chloride of gold is mixed with a solution of bichloride of mercury. Dry the picture, and varnish it with a colourless transparent varnish.

If the print is to have a vignette form, you must introduce the proper blind within the camera and between the lens and the porcelain plate to produce the vignette. These vignette forms are easily made out of black paper, being first cut of an oval or ellipitical shape, and then the edges are cut stellated, so as to soften the gradation of the picture towards the white background.

The porcelain picture is about the handsomest of all photographs, and especially when artistically coloured does it become a work of art.

The Photographic News.

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PATENT MEZZOTINT VIGNETTE PORTRAITS.

We have received several further letters on this subject since the issue of our last—some for publication, and others simply asking for information as to the bearings of the patent law in such a case. In every instance a familiarity with the method and the results, generally dating some years back, is claimed, and the question is asked if the writers, having each invented the method for himself, and used it for some years, must now pay a licence fee to obtain permission for its continued use.

Such a necessity would undoubtedly seem hard in such a case. Whether such a necessity could arise must depend, we apprehend, on the exact details of the case. As we stated in our last, the mere fact of some one having privately or secretly practised the method would not invalidate the new patent. Prior public use of an alleged novelty will, it is true, bar a patent; but what constitutes public use is not quite easy to state, and all the facts would have to be carefully set forth and estimated by the proper tribunal before a decision of any value could be attained. One fact seems tolerably clear: the method in question has not been very publicly practised. With unusual facilities for gaining information and seeing novelties, we certainly had not seen the effect until Mr. Brown brought examples under our attention. None had been sent for our editorial inspection, nor with a view to give information to portraitists generally, that a pretty novelty was easily produced. None had been exhibited at photographic exhibitions; nor had we either seen or heard of them in any other way. Whether there was sufficient public use of the method in question to render Mr. Brown's patent invalid, we are, of course, unable to state; but if his patent be good, the continued private use of the method for years will not give the person who has so used it any claim upon it, or militate against Mr. Brown's right to claim the licence fee.

It is a curious fact, however, that of several examples sent, some of them very good ones, and produced in manner closely resembling that of Mr. Brown, none is quite equal in our estimation to the examples Mr. Brown has placed before us. In none is the effect so delicate and satisfactory; there is generally too much of the added background. In some cases the pattern is too pronounced, and in all cases it is too deeply printed. Where an effect is similar but not the same, we can offer no opinion at present as to how far it may affect or may be affected by the patent, as we have not yet seen the specification. In one case, a correspondent (Mr. David Rees) published a method of producing an effect similar to that of Mr. Vander Weyde by double printing, and he thinks that if we now republish his letter it will aid in solving the present question. The letter appeared in our issue for June 7th, 1872, and runs as follows:—

"The way to get a pleasing effect in stippling a photograph is to make a negative from any stippled surface, and, when your print is finished, lay it (the stippled negative) on the print just long enough to get a faint impression of the stipple for the face. Then use for print a stipple larger and stronger for the drapery and background, masking out where you do not want it."

It will be seen that here the stippled or grained effect was to be produced in the face, as well as the rest of the picture, an aim quite distinct from that of Mr. Brown.

It is possible that the public use of some of the methods of which examples have been sent to us may affect Mr. Brown's patent; but at present we can offer no opinion. We can in some degree sympathise with the annoyance of those who may for years have been employing a method something similar, and are now suddenly called upon to pay a licenee fee for the continued use. But, after all, they had the remedy in their own hands. If they had publicly described the novelty for the benefit of the photographic community at large, no patent could have been taken for it. "One who has Risen from the Back Yard" suggests as a remedy—ironically, it is true—that photographers to whom a bright idea may occur should always rush off to the Patent Office at once and secure it! We may suggest "another way." Let the bright idea be at once communicated to photographers at large, through the journals. This will prevent the risk of the inventor being himself at some time finding his idea embodied in another's patent, and it will show that the objection to patent monopoly with which photographers have been credited is a genuine sentiment, and not merely a selfish desire to share the advantage of the labour of others, without in any form offering a *quid pro quo*.

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HINTS ON MANIPULATION, EXPOSURE, AND DEVELOPMENT OF COFFEE PLATES.

We recently gave some details of a mode employed in preparing coffee plates by a correspondent in Switzerland, who prefers to be known simply as "J. H. W.," whose pictures we described at the time as possessing a degree of technical and artistic perfection rarely found—even in the highest class wet plates. Further examples of his work confirm the opinion we then expressed. In response to our request for further information as to his manipulations and formulæ he has favoured us with the following details. It will be seen that a high degree of precision, patience, and care, which reminds us of the manipulations of Mr. R. Manners Gordon, characterizes his operations. After expressing a conviction that the excellence of a negative depends almost as much upon its careful development as upon the preparation of the plate itself, he proceeds:—

Many persons, and among them those who know vastly more than myself of the art of photography and its requirements, tell me that much of the care and many of the precautions which I take are entirely unnecessary, and that equally good results could be procured with less trouble and pains. I cannot say whether this is so or not; all I can do is to tell you what method I have adopted to produce the result which appears to have met with your kind approbation, and then to allow each one to indulge in such deviations or omissions as they find from experience may be successfully done. I would here say that neither in coating with albumen nor collodion, nor in any subsequent manipulation, do I *ever* hold the plate by the corner, as is usually done, but invariably make use of a pneumatic holder, thus avoiding the untidy appearance caused by the thumb mark upon the negative—not the only disadvantage, as I think, from this practice—as the warmth from the fingers affects the plate to a considerable distance beyond the point *actually* grasped. It is, besides, a great satisfaction, and often advantage, to be able to work neatly and clean to the extreme edge, and thus, if your lens covers well, to secure a picture the *full* size of your plate.

I will now give you the formula for the developer:—

No. 1.—Alcohol	... ...	60 grammes
Pyrogallic acid	...	8 ,,
No. 2.—Distilled water	...	60 grammes
Carbonate of ammonia		8 ,,
No. 3.—Distilled water	...	200 grammes
Pyrogallic acid	...	1 ,,
Citric acid ...	...	1½ ,,
No. 4.—Distilled water	...	100 grammes
Nitrate of silver	...	3 ,,

All of these preparations should be filtered from time to time, and if kept well corked will keep indefinitely, decidedly improving with age, though changing—particularly No. 1—in colour.

The application is very simple, and as follows:—

Upon taking the exposed negative from the frame, place it, good side up, for say five minutes, in a dish containing clean water of sufficient depth to cover it well, say half an inch. Move the dish occasionally to expedite the washing, and it is an advantage to have the water slightly tepid.

Taking the plate from the dish, pour upon it, with a clean steady sweep from a developing glass, sufficient of the following mixture to cover it well, but *without waste*:—

Water	1 ounce
No. 1	20 drops
No. 2	20 ,,

When the details are well out, wash the plate carefully *both sides*, taking it, if not too large, off the holder, and holding it by the edges; but if too large to stretch the fingers across, then keep upon the holder, and wash underneath as close as possible to it.

Next flow with No. 3, taking sufficient quantity to cover the plate comfortably. Allow the mixture to remain on for a few seconds, and then, *returning it to the glass*, add of No. 4 in the proportion of 10 to 12 drops to the ounce. This mixture must now be poured on and off the plate with care until the negative has assumed sufficient density, when *immediately* wash thoroughly on both sides as before. Next fix with a strong solution of hyposulphite of soda, which I do by pouring from a small pitcher; and I never use the same solution a second time, the cost of fresh being insignificant. After fixing, wash again *more thoroughly*, and your labours will be completed with, I hope, the success which now almost invariably attends my own.

P.S.—Regarding time of exposure required for these plates, as compared with wet, I hardly know what to answer, never having tried the two upon the same subject, nor under *exactly* similar conditions. I have taken a very satisfactory picture of a pair of oxen (specimen of which I sent you some time since) in five seconds, and for which I should, with a wet plate, have allowed three seconds. I think, as a rule, it would be safe to say *double* the exposure required for a wet plate; and it should always be borne in mind that *considerable* over-exposure is preferable to the slightest under-time, as the former may be, to a great extent, remedied and controlled in the development, but the latter *never* satisfactorily. In making transparencies from these plates I have found *one* second in full (not sun) light to be ample. Any further information desired I will give with great pleasure. J. H W.

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REMOVING SILVER STAINS.—EXPLOSIVE COMPOUNDS IN PHOTOGRAPHY.

A communication from Mr. Spiller calls our attention to a formula which occurs in a series of studio hints which appeared in our last Year-Book, from the pen of one who was an esteemed contributor to our pages for many years —Dr. Maidstone Smith, of Bath. The question which closes Mr. Spiller's letter cannot, alas! be answered, as the writer of those hints is dead; he died a few months ago. We may, however, fairly assume that the preparation described proved both efficacious as a detergent and harmless in his hands, as he recommended the compound of iodine and ammonia to supersede the use of the dangerous agent so commonly used to cleanse stained fingers—cyanide of potassium. Having been himself a sufferer from the poisonous effect of the latter poison, his aim was to give to photographers a non-poisonous substitute which should prove at the same time rapid and effective.

The dangerously explosive character of the iodide of nitrogen formed by the combination of iodine and ammonia renders its use undesirable. Possibly no better detergent for general purposes exists than the tincture of iodine, followed by a saturated solution of hyposulphite of soda. Mr. Spiller says:—

"I cannot help thinking that the instructions given at page 67 of the Year-Book, by Dr. R. Maidstone Smith, for the preparation of an iodine compound, to be used in removing silver stains from the hands, are fraught with danger to those who attempt to put them in practice. Dr. Smith recommends your readers to make a mixture of four parts of saturated tincture of iodine, and one part of the strongest ammonia; but on proceeding, myself, to make such a mixture, the anticipated result followed,—viz., the precipitation of the explosive iodide of nitrogen.

"Watts's Dictionary of Chemistry, vol. iii., p. 280, describes exactly this mode of formation, 'by adding ammonia to a saturated solution of iodine in alcohol,' and the properties of the so-called iodide of nitrogen are then given. 'A brownish-black soft powder, which when dry explodes from the slightest cause, producing a loud report, and destroying any solid bodies that may be near it. It may be exploded by friction even under water, and in the dry state can scarcely be touched without exploding.'

"As I have said before, in my hands an experiment made according to Dr. Smith's instructions (with 880 ammonia) gave me a considerable deposit of iodide of nitrogen, which, filtered off and allowed to dry spontaneously, exploded at once when touched with a hot rod, giving a sharp and loud report. The author states that he has 'long used' this preparation for removing silver stains from the hands, and it would be interesting to know whether at any time Dr. Smith has met with indications of the formation of this dangerous compound.—I am, dear sir, yours very truly, John Spiller."

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OBSERVATIONS IN THE TYROL.*

BY H. BADEN PRITCHARD,

Author of "Beauty Spots of the Continent," &c.

I am afraid my readers will scarcely find the little village of *Unser lieben Frau* upon the map. It is situated to the south of the Oetzthal Glacier, and is the resting-place to which most travellers hereabouts direct their steps in coming over the mountain chain which separates Southern Europe from the North. Arrived in Mid Europe, the traveller going south must perforce cross the mountains somewhere, and although he can do so now-a-days by railway in two spots—to wit, by the Mont Cenis, and the Brenner—there is everywhere at least a six thousand feet barrier to pass. The Oetzthal Glacier, which I had already visited from the south, near the Finstermüntz Pass I had never crossed before, for an attempt to do so some time ago ended in a sprain to one of my ankles, and since then I have not had another opportunity.

You approach the Oetzthal from the Valley of the Sun, and half way up the *thal* there is a cart track, but for the other twenty miles there is little else but a foot-path. It is scarcely to be expected that under the circumstances there are any extensive hostelries to be met with; indeed, at the last two halting-places up the valley—Holy Cross, and Fend—there is nothing to do but go to the clergyman's house for entertainment. The Herr Curat, however, is quite used to receiving strangers, and has a sitting-room set apart for their use, while at the top of the house are a series of bedrooms where the guests make themselves quite as much at home as if they were at an inn. One might think that there would be a difficulty as to payment. Not at all. It is not etiquette, certainly, to ask the Herr Curat, sharp and short, "What's to pay?" but you address yourself to his housekeeper or waiting-maid, and she tells you to a kreutzer the exact sum you owe, just as if she were the waitress at an inn. The clergyman, no doubt, adds a little to his income by acting the part of host, and when I mention that the fixed salary of the curate at Holy Cross is only 259 florins, or ten pounds a year, any addition of the kind must be very welcome. In the two cases where I came into contact with these spiritual gentlemen I found them excellent companions, and we parted after four-and-twenty hours' acquaintanceship the best of friends. It is a catholic country hereabouts, as Holy Cross, and the name of this place, "Our Dear Lady," would indicate; but the gentlemen I speak of were far from bigots. At Holy Cross the Herr Curat and I spent the afternoon in a photographic ramble, and among other pictures I secured one of the church and the parsonage, standing in a most romantic situation, on a rocky pedestal in the middle of the village, and also of a stupendous snow avalanche, which almost filled the ravine in one part of the valley. This gentleman could hardly part with us, but walked a long way on our journey before he said good-bye. At Fend, the highest hamlet in the valley, whence the start over the glacier is made, our clerical host again was also very kind, albeit we had made up our mind to climb the ice on a Sunday; as the guides had to attend church before starting, he promised us that the service should not be unnecessarily delayed

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* Continued from page 331.

The season has been very late here, and our party was only the second that crossed the ice this year, owing to the large amount of snow that covers the glacier, and which usually vanished by the beginning of July. However, we crossed in safety, and I had the pleasure of securing some pretty snow scenes with my camera and roller dark slide.

There is one advantage that the latter possesses for the tourist over dry plates, which is hardly apparent till the actual experience comes. I have hitherto travelled with two double dark slides, so that during the day I had four plates to expose, no more and no less. At night the exposed plates were packed up, and fresh films substituted. Having so few plates at my disposal, I was wont to be very chary of them in the morning, and always considered twice before I decided upon using one and the consequence was, that many a time I have let a fine opportunity pass, while in the evening I have still had an unexposed plate in my pouch. With the roller dark slide this never happens. You need not be too sparing at the commencement of the day, nor too prodigal at the end fearful lest you should bring home unexposed plates; sometimes you take six or eight pictures in the day, while at other times you never screw the rollers round once.

I see that hotel proprietors are giving up having fancy show-cards of their hotels, and instead of the bright-coloured sketches of eligible inns to be met with at railway stations and elsewhere, there are to be seen instead handsome photographs of the houses that proprietors desire to recommend. The grandeur of the houses and the beauty of the neighbourhood suffer a little by the change, but visitors certainly gain, for they are now enabled to see what an hotel really is like. Before, every Swiss innkeeper used to paint a blue lake in the foreground of his house, and depict a white crystal glacier flowing down into his back garden. In the photograph the lake and the glacier somehow disappear altogether, or are seen reduced to within very moderate limits. But the hotel-keeper has no doubt found that all the world over honesty is, after all, the best policy, and so recourse has been had to the camera to depict the truth.

One thing that strikes the traveller very forcibly in these parts—or more especially, perhaps, in Bavaria, where I have been walking—is the adoption in the Fatherland of French measurements, &c. At the end of the last war, it will be remembered, an attempt was made by the German Government to supersede French as the diplomatic language, but a despatch from Bismarck, or, rather, the German minister, to our own, written in the German language, was replied to in English, and I believe shortly after this French was again resumed as the international language. Do what they will, the French appear to assert themselves more than ever in Germany. Instead of the German mile and Stunde (a most arbitary measurement), the kilometre seems now to be adopted everywhere, and along the roads the "mile-stones" are all marked with kilometres. In the same way the decimal coinage has been universally adopted, and since the 30th of last month groschens and kreutzers are no longer current. In Germany everything is reckoned according to marks and pfennigs, now-a-days a hundred pfennigs going to a mark, which is as near as possible a shilling. So that marks and pfennigs are stated just like francs and centimes in France. Again, the wine is sold by French measurement, the litre (or litter, as they here pervert the word) being the standard.

Notwithstanding their aversion to the French, therefore, we find the Germans still going on adopting that language. This may be praiseworthy enough where the French words are the best and most expressive, but it is a little too bad, I cannot help thinking, that the words shall be "Germanised" in the process. If the litre answer your purpose, adopt it by all means, but keep to the proper spelling, to indicate it is a French word. This practice of putting a German ending to a French word is a most prevalent custom. The word gouter becomes goutiren, man'zelle is altered to mamzellchen, dejeuer to dejeuniren, gener to geniren, and so on. If our German cousins do not take care they will lose their language altogether one of these days, for it must not be presumed that these perversions are simply employed in speaking, but they are to be met with in the authors of the day.

I am now on my way to Meran to get better knowledge of the Dolomite mountains, for the slight acquaintance I already possess has made me desire to know the district more closely. Since we have crossed the mountains, and have descended into a more southern clime, the landscape has become quite Italian. The yellow corn here is already in sheaves, and the glaring white road is bordered with trellised vines and the soft green foliage of the walnut. I hope to walk into Meran, the ancient capital of the Tyrol, to-day.

Unser lieben Frau, 12*th July*, 1876.

PHOTOGRAPHERS' FALLACIES BY THE DOZEN AND ONE.

BY J. BULLOCK.

There is a curious tendency, probably in all arts, but certainly in relation to photography, for certain fallacious notions to become firm articles of faith amongst the inexperienced and unobservant. The following are amongst the most prevalent, and have constantly come under my attention, as requiring correction.

I. To suppose that a shorter exposure should be given in the camera to a lady in a white dress, or to a white building among trees, than to a lady in dark dress, or to a dark building, and to think that harmony can be got without as long, or if anything a longer, exposure than would be required ordinarily.

II. To suppose that a portrait taken against a dark background requires as much intensifying as one taken against a light background.

III. To suppose that it saves time, and that a better result can be got from an under-exposed negative well worked up than by going to work again, and taking a well-exposed and thoroughly good negative, which requires very little working upon.

IV. To suppose that if there is a great blot in the background of the negative it does not matter; it can be stippled out.

V. To suppose that a clod in the collodion film will clear out with the hypo or cyanide.

VI. To suppose that it does not matter if spots are touched out carelessly; the spotter-out will make it all right.

VII. To suppose that rigid sharpness is the acme of perfection.

VIII. To suppose that the smallest stop should be used if it does not make the exposure too long, and that the background and back hair should be as sharp as the prominent parts of the face.

IX. To suppose that expression is of minor importance, and that the more a negative is worked upon the better the prints, especially if they make men and women's faces look like babies, or a bladder of lard.

X. To suppose that if there is plenty of art quality displayed in the picture, neatness and cleanliness in the finish are not necessary.

XI. To suppose that too deeply printed, a photo will be light enough when toned and fixed.

XII. To suppose that an over-toned print will be warm enough when passed through the hot roller.

XIII. To suppose the light is in any way altered by passing through a low glass roof or a high one.

"BLISTERS,"—HOW THEY MAY BE PRODUCED, AND HOW THEY CAN BE AVOIDED.

BY T. H. LANE.*

I have read innumerable speculations upon the subject of "blisters" on albumen prints, wherein various causes have been suggested, and many antidotes offered for their cure. Experience has taught me one certain cause, and also a sure remedy for the disease.

More than a year ago, I allowed my silver solution to become acid, and, besides other difficulties, blisters appeared. Then, as now, I fumed the silvered paper. About that time I noticed a communication in one of the British photographic almanacs, written by Mr. Stuart, of Glasgow, in which he recommended sal soda in the sensitizing bath, and subsequent toning with borax and gold. With some modifications I adopted his suggestions, and blisters disappeared. In this process every step is taken on alkaline ground.

Lately, my silver solution getting out of order, I added some nitric acid, intending to neutralize it, but failed to do so, and again the blisters became a fact. An addition of sal soda relieved me of the evil. Feeling assured that acidity before fuming had in my case produced blisters, I determined to make a severe test in this direction; and a bottle of citric acid in solution being at hand, I added an excessive quantity to my bath, making it intensely acid. The paper used in this instance was the "extra brilliant double albumenized," which was fumed as usual. To my surprise the proofs printed with great brilliancy, and toned quickly and finely; but, immediately on immersion in the hypo bath, they were covered with blisters. Another sheet of the same kind of paper was silvered on the acid bath, and proofs printed without fuming. These prints were quite as brilliant as those made on the fumed paper, but they toned badly. When placed in the fixing bath not a blister appeared.

From previous experience and this test, I am satisfied that ammonia vapour, in the presence of an acid, originates the disease which the action of the hypo bath develops. I will add that the water used for the toning and fixing baths above alluded to was taken from an outside cistern, and was but a few degrees above the freezing-point.

I leave theorists to speculate over this matter, but to practical people I say, keep your printing solutions alkaline or neutral, and you will not be annoyed with "blisters."

Perhaps I should add that I do not confine myself to the borax bath, but use as often phosphate of soda, acetate of soda, and acetate of baryta, when making up toning solutions.

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* *Philadelphia Photographer.*

Correspondence.

PRICE OF NITRATE OF SILVER.

Dear Sir,—Can you tell me how it is we do not get silver nitrate cheaper yet? When I send my waste to refiners I only get allowed at the rate of 3s. 11d. for the metallic silver, while a short time since I was allowed 5s. 2d., a difference of 1s. 3d. per ounce. At the same time silver nitrate is only 1d. an ounce cheaper, so that the reduction in the price of silver is really the cause of considerable loss to me.—Yours truly, J. L.

[The only answer we can give is that given by one of the most extensive manufacturers of nitrate of silver, in a letter in our pages two or three months ago.—Ed.]

ANOTHER NEW STYLE OF PORTRAITURE.

Dear Sir,—From a glance at the photographic publications of this week, I see that another bone of contention has been thrown in the photographic arena, and picked up with more than ordinary zest. I believe that all who aspire to enter their name on the list of "inventors" ought to be prepared to have their claims fairly examined, and be honestly disposed to submit to whatever decision is come to with regard to them.

Messrs. Heath and Bullingham have told you exactly how the matter stands; and hundreds of others could say the same thing, if they remembered all the little dodges which M. Lambert has shown to his licensees. I may inform you that he has thrown in a few of these, and has never thought of placing any restriction upon their use by anyone. He did not consider such trifles worthy of special notice. There is very little reason for animadversion at all, even as the case stands, because, after all, no one is compelled to purchase licences, and every one is perfectly at liberty, if he be so minded, to print a granular-retiring vignetted background in his photographs. To accomplish this, I may tell you the method I employed more than eighteen months ago. Specimens of that date are still kept here. It has the twofold advantage of being done at one printing, instead of two, and failures are not possible: by applying a piece of coarse mineral or tracing paper to the back of the negative; this is easily accomplished by damping the paper between sheets of blotting paper previously wetted for the purpose. After gumming the edges of the negative, the mineral paper must be laid on it and allowed to dry. It will tighten, and admit of working on it with a lead pencil. Proceed to make coarse hatchings round the head and that portion of the figure intended to appear in the vignette; then print in the ordinary way.

As a matter of information I would just ask you one question: In virtue of what legal instrument could it be pretended to prosecute anyone when a provisional protection has been applied for? Should a protest be lodged against the granting of Letters Patent, I suppose it will be a case of returning the money, and say "*peccavi*."—I am, dear sir, very truly yours, C. Ferranti.

Bold Street, Liverpool, July 24.

Dear Sir,—If my memory fails me not, I believe I once saw an article in one of the photographic almanacs showing how Mr. R. Brown had nearly become a great inventor. From your last issue it would appear that at last he has "become a great (?) inventor." But I rather fear that his invention is not very new, as I, and I daresay every one of M. Lambert's licensees, will remember that the way he (M. Lambert) produced his imitations of Vander Weyde effects was by printing around a vignette with a negative taken from a piece of morocco leather. Now, if the "fake" of Mr. Brown is to be considered a valid and *bona fide* invention, I wish to say that I have done a similar thing years ago with negatives taken from printed calicoes, showing promiscuous designs in pin-work, engravers' stipple, &c. ; and to prevent other patents being taken out will name one or two other substances that might be made the subjects of patents by some unfortunate inventor. The following are one or two things I will name as suitable to form the basis of a patent :—1st. A negative taken from a large piece of glass stippled by a painter with dark paint and a large brush. 2nd. Negative of a rough cast wall, *i.e.*, a wall plastered with mortar, and then, while the mortar is wet, covered over with small pebbles. 3rd. A negative taken from the backside of a hard oatcake. I name the above three things for fear some person might take it into his head to patent them. If anyone thinks they are worth anything he may send £2 2s. to the treasurer of the Photographers' Benevolent Society as a sort of acknowledgment. I suppose that is the price of Mr. Brown's process.—I am, dear sir, yours truly, S. Wolstenholme.

Blackpool.

Dear Sir,—On looking over the advertisements in last Friday's issue of your valuable journal my attention was suddenly drawn to the words "Caution—Mezzotint Vignette—Provisional Protection granted," &c., &c. Now, as I have had about fourteen years' experience, principally in the printing departments of some of the leading photographers in England, and being now in business for myself, I was, as you may imagine, at once deeply interested ; and, therefore, with eager eyes, looked further and found your article, in which you describe the said vignette, and how produced. Judge of my astonishment when I found that I had produced months ago what appears to me to be the same effect, and have had specimens of same in my reception room ; but have never obtained orders for similar effects, therefore none have been sent out. Had I have received orders I should, of course, have executed them, as it was purely my own idea, having never seen or heard until last Saturday of the same being produced by any other person ; and if any other photographers had asked me how they were produced I should have been pleased to have given the information, as I considered the means of production so simple. The idea first struck me when doing the cameo vignettes, with fancy border, and as I always tint my vignettes, and have done so for some years, by placing a piece of cotton wool over the face and exposing to light, I therefore obtained a piece of paper, a small portion of which I enclose, took a thin negative of it with a few seconds' exposure, and, instead of placing my vignette, as usual, under clear glass to tint, I used my thin negative in place thereof, with the cotton wool over face ; thus I obtained the result, a specimen of which I enclose. Now what I wish to know, dear Mr. Editor, is this : Is the result I have obtained precisely the same as that of Messrs. Brown and Barnes, and obtained exactly by the same method ? *If not*, can it be said that it is an imitation thereof, or that, if I should continue to do them, I should be infringing their patent ? For it appears to me, that should I wish to continue the production of a thing I have done months ago, and which I firmly supposed to be my own *bona fide* invention, I must now pay a licence of two guineas.

If such be the case, I should certainly recommend every brother photographer in future, immediately the bright idea strikes him that he has hit upon some new but simple little dodge, to rush off to the Patent Office *at once*, and secure his wonderful discovery (or invention) without the least delay. What a happy and prosperous time that will be for our noble art !—I beg to remain, dear Mr. Editor, yours respectfully,

One Who has Risen from the Back Yard.

Sir,—Various virtuous protests have been made against Mr. Richard Brown and his patent for producing a grained background in vignette portraits. The same ingenious discovery, it appears, has been made, according to their own account, by many other photographers. Their claims may or may not be good—that is a point of small interest to the public—but if they are good, whence their sudden and virtuous objections to Mr. Brown's alleged attempt at monopoly ? In every instance in which this mode of working has been "invented" or "discovered," or whatever the term may be, before, it has manifestly been kept quietly for the use of the inventor. We find no account of it in photographic literature. With what kind of face, then, can men who have worked a process quietly for their own benefit complain of Mr. Brown, who, finding a good thing, offers to share it with his fellows for a moderate sum, sufficient to pay for the expense of bringing it before them, with, it is to be hoped, a final few pounds over ?—Yours truly, A. B.

PATENTING GELATINE EMULSIONS.

Dear Sir,—I will not attempt to argue the point as to which is in the right with reference to Mr. Kennett's patent, Col. Wortley or Mr. W. Brooks, but will allow the public to draw their own inference from what I have to say on the subject.

In the spring of 1865 I took out a patent in England, France, and America for gelatine emulsion for the production of photographs on glass, wood, stone, slate, iron, &c., and have since that time worked the process with success for various purposes. As to pellicles, my emulsions were constantly being converted into that form, to my great annoyance, before I invented a plan by which I could always have the emulsion in a fluid state without the constant trouble of warming before coating the surfaces.

The time for which I obtained my patent was seven years ; consequently it has long since become the property of the public. There must be something radically wrong in our patent law to admit the possibility of any person obtaining a patent for a thing that has been patented before.—I am, dear sir, yours truly, W. H. Smith.

2, rCrogsland Road, Havistock Hill, N.W., July 19.

[Our correspondent scarcely, we think, apprehends the real point in discussion, which is not the origin of gelatine emulsions, but of a sensitive gelatine pellicle from which sensitive dry plates may be readily prepared. Mr. Smith's patent was for a gelatino-chloride of silver emulsion and modes of using it.—Ed.]

Sir,—Mr. Brooks, in his letter last week, avoids the principal points which I have brought forward regarding Mr. Kennett's patent. These are the questions which, if he can give evidence in favour of Mr. Kennett, he should answer :—

1. Did Mr. Brooks ever see Mr. Kennett make a gelatine emulsion, or does he know of his own knowledge that he made one previous to the publication of the formula by Dr. Maddox in 1871?

2. Did he see Mr. Kennett pour out an emulsion, and so form from it a pellicle, previous to the publication of Mr. Johnston's formula for that purpose published on the 14th November. 1873?

3. Can Mr. Brooks state, or can he obtain evidence from Messrs. Haseltine and Lake, that Mr. Kennett's manuscript specification was in their hands for registration in the Patent Office, and which registration was duly made on the 20th November, previous to the publication in the Photographic press of Mr. Johnston's formula on the 14th November?

I have had most reliable evidence offered to me, and I thank those gentlemen who have so kindly written to me on the subject, that Mr. Kennett had not anticipated either of these two gentlemen, but that, on the contrary, he was merely a follower of theirs; and unless Mr. Brooks is prepared with perfectly clear and very strong evidence to the contrary, I maintain it to be clear that Mr. Kennett has copied his patent from the previous publications of Dr. Maddox and Mr. Johnston, and has added thereto the method of drying the gelatine patented by Mr. Nelson in 1839. I maintain this to be grossly unfair to the photographic public.

Mr. Brooks informs us that Mr. Kennett has a good deal more photographic information that he does not intend to publish; and as he has never published anything, I think it quite likely he will not do so now; but judging from his action in the matter of the Maddox-Johnston formulæ, I shall expect the photographic world to learn through the Patent Office anything of value that Mr. Kennett may discover. I take this opportunity of stating that I have raised this question solely on public grounds, and that I have no knowledge whatever of Mr. Kennett personally, beyond having met him once in the room of a gentleman to whom we are both known, and that any attack, as Mr. Brooks call it, that I may make upon him, I make solely in reference to his action in this special matter.—I am, sir, faithfully, H. Stuart Wortley.

Proceedings of Societies.

Amateur Photographic Association.

The annual council meeting of this Society was held on the 18th inst., at 12, York Place, the Right Hon. the **Earl of Rosse** in the chair. The minutes of the last meeting having been read and confirmed, the following members were elected:—Major Chadwick, Captain Douglass MacNeill, J. Taylor Smith, Esq., M.D., F.G.S., &c.

Mr. **Glaisher** again brought forward the question of the revision of the following rule:—"The prize negatives shall become the property of the Association, but in any case the proprietor shall be at liberty to decline to part with his negative, whereupon another shall be selected for the prize."

The **Secretary** explained that the rule (although no instance had occurred of a prize being refused) was felt by many to detract much from the value of the prize received, and that whilst the recipients might much regret the loss of their best negatives, the Association obtained no corresponding gain, the prize negative being of no commercial value whatever. After much consideration it was proposed by Sir Antonio Brady, "That in future the prize negative, instead of as heretofore becoming the property of the Association, shall be retained for three years only, and then at the option of the owner may be withdrawn; but that the council shall be in no case responsible for breakage or any injury the prize negatives may receive whilst in their custody." This resolution was seconded by Mr. **Glaisher**, and decided by the meeting.

The **Secretary** then laid before the meeting the pictures for the current year; but it was found impossible to examine them all with sufficient care to make the award that day. The meeting was therefore adjourned to the following Tuesday.

A. J. Melhuish, Hon. Sec.

Talk in the Studio.

Autotype Fete at Henley.—On Saturday last the employés of the Autotype Company held their annual outdoor fête at Henley-on-Thames. After a pleasant journey by train, the various lions in the quaint old town were duly visited until one o'clock, when the company sat down to a substantial dinner at the Bull Hotel, Mr. Sawyer occupying the chair, Mr. Spencer the vice-chair. When dinner was over, the company—after a few words from the chairman—adjourned to the banks of the Thames, where they were photographed by Messrs. Marsh Brothers. After this exhausting ordeal, recourse was had to the Bull Hotel for tea, after which all dispersed in various directions—boating, fishing, bathing, &c.—to re-assemble after a very pleasant day at the Railway Station, for the last train, and to bid good-bye to and to thank Messrs. Marsh for their kind hospitality, they having practically kept open house, and also to regret that such a pleasant day had ended so soon.

The Patent Scrap Roller.—The name given to this useful adjunct to mounting photographs scarcely sufficiently suggests its character. It is really a very excellent elastic roller for passing over prints after they have been pasted and placed *in situ* upon the mount, whether card or scrap-book. The roller is covered with a sufficient thickness of vulcanized india-rubber to make it firmly elastic, and is fitted in a convenient handle for use. The rollers are made in various sizes, from card size upwards, by Mr. Raphael Tuck, of City Road.

Colouring Brasswork.—The *Scientific American* gives the following:—"In the following will be found valuable details relative to the colouring of brass. An orange tint inclining to gold is produced by first polishing the brass, and then plunging it for a few seconds in a warm neutral solution of crystallized acetate of copper. Dipping into a bath of copper, the resulting tint is a greyish green; while a beautiful violet is obtained by immersing the metal for an instant in a solution of chloride of antimony, and rubbing it with a stick covered with cotton During this operation the brass should be heated to a degree just tolerable to the touch. A moiré appearance, vastly superior to that usually seen, is produced by boiling the object in a solution of sulphate of copper. There are two methods of procuring a black lacquer on the surface of brass. The first, which is usually employed by instrument makers, consists in polishing the object with tripoli, and washing it with a mixture composed of nitrate of tin 1 part, chloride of gold 2 parts. Allow this wash to remain for fifteen minutes, then wipe it off with a linen cloth. An excess of acid increases the intensity of the tint. In the second method, copper turnings are dissolved in nitric acid until the latter is saturated; the objects are immersed in the solution, cleaned, and subsequently heated moderately over a charcoal fire. This process must be repeated in order to produce a black colour, as the first trial only gives a dark green. Finally, polish with olive oil. Much pains are taken to give objects 'an English look.' For this purpose, they are first heated to redness, and then dipped in a weak solution of sulphuric acid. Afterwards they are immersed in dilute nitric acid, thoroughly washed in water, and dried in sawdust. To effect a uniformity in the colour, they are plunged in a bath consisting of 2 parts nitric acid, and 1 part rain water, where they are suffered to remain for several minutes. Should the colour not be free from spots and patches, the operations must be repeated until the desired effect is produced."

Removal of Silver Stains from Woven Fabrics.—Chloride of copper completely removes, even from coloured woven tissues, stains occasioned by nitrate of silver. The fabric is to be afterwards washed with hyposulphite of soda solution, and then thoroughly washed with water. From white cotton and linen goods are still more readily removed by application of dilute solutions of permanganate of potassa and hydrochloric acid, followed by washing with hyposulphite of soda, and a good rinsing with water.—*Druggist and Chemist.*

Preservation of Paste with Salicylic Acid.—The souring and moulding of paste which, according to circumstances, occurs in about two or three days, may be entirely avoided, according to the statement of Herr P. Lang, by the addition and thorough mixture with the freshly prepared paste of a few drops of salicylic acid. When thus treated, a paste may be kept for weeks in a heated room and without losing its freshness, and even when it has by long standing become dry and tough, may be at once rendered fluid and serviceable by treatment with hot water. The addition of the acid does not, according to this author, affect the stickiness of the paste to any sensible degree.

RESTORATION OF FADED WRITING.—Moisten the paper a little with water, and brush over it a solution of sulph-hydric ammonia. Since most inks contain iron, it is easy to understand that there will be formed sulphide of iron, which is black.

A METAL MORE FUSIBLE THAN TALLOW.—M. Lecoq de Boisbaudran, whose recent discovery of the new element gallium, and whose subsequent researches thereon we have from time to time noted, has recently, for the first time, succeeded in obtaining a grain and a half of the metal in a pure state. This has enabled him to determine the remarkable fact that gallium melts at 85·1° Fahr., so that it liquefies when held in the hand. When solid, the metal is hard and resistant, even to a few degrees below the melting point. It can be cut, and possesses a slight malleability. When fused, it adheres easily to glass, on which it forms a beautiful mirror, whiter than that produced by mercury. It oxidizes but very superficially when heated to redness in the air, and does not become volatile. The density at 59° Fahr. is 4·7, that of water at 39·2° Fahr. being 1. Excepting mercury, which only becomes solid at —37·9° Fahr., there is no other element which liquefies at so low a temperature as gallium. Fusible alloy, of 1 part lead, 1 part tin, and 1 part bismuth, melts at 201°, and phosphorus at 111·5°. Wax and tallow have melting points respectively at 142° and 92° Fahr.—*Scientific American.*

A FINE negative has been obtained it is said, from Da Vinci's cartoon in possession of the Royal Academy, and permanent photographic transcripts will soon be in the market.

TO BLACKEN BRASS.—TO CLARIFY SHELLAC SOLUTIONS.—The *Bulletin Belge de la Photographie* gives the following as a good and convenient method of blackening brass surfaces for photographic purposes:—The metal, having been thoroughly cleaned, is brushed over with a solution of bichloride of platinum, known as chemical bronze. If one or two drops of solution of nitrate of silver be added to 1-6th of a cubic inch of the plantinum solution, its action is considerably augmented." For clarifying solutions of shellac, the same journal recommends the addition, to the varnish it is required to clear, of a quantity of powdered chalk equal to the weight of lac used. After thoroughly mixing, and heating to 60°, the mixture is allowed to settle, when three-quarters of the bulk may be poured off perfectly clear, or, if necessary, it may be filtered with the greatest ease.

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To Correspondents.

DR. MANTELL.—We have no precise information as to the process and mode of toning employed by Col. Wortley in producing his charming transparencies at the Scientific Loan Exhibition, now open in South Kensington. We presume that they are obtained by his emulsion process, of which details have from time to time appeared in our pages. Possibly Col. Wortley will kindly give the information.

AMATEUR PHOTOGRAPHER (Worslop).—The special lenses you mention as included in a second-hand catalogue, have very much the qualities of the ordinary single landscape lens, and are not likely to answer your purpose better than the lens you have. We cannot recommend the productions of special makers by name in this column; but if you will send a list, with a number attached to each name, we can indicate that which seems best suited to your purpose. 2. The general character of the arrangement you have for controlling the light in open-air portraiture seems suitable enough; but the canopy would be better if it extended a couple of feet further. As a rule you will only need to use one side at a time. Let the face incline towards the drab wing for the shadowed side, and remove, or push partially back, the white wing; they will enable you to get a better effect of light and shade. Possibly, also, you expose too long.

X.—In using india-rubber to mount photographs in a scrap-book, we prefer to apply it to the edges, or corners, only. In course of time india-rubber decomposes, and loses its elasticity and its adhesive quality, and if it has been applied to the entire back of the print and partially permeated the paper, it is apt to produce a brown stain.

MEZZOTINT VIGNETTES.—R. WICKS sends us a very good example of a vignette with grained background, resembling those of Mr. Brown. His is, however, different, being larger in pattern as well as deeper printed, and is less delicate in effect than those we recently described. As you will learn from a short leader on another page, we cannot with precision answer your questions. DAVID REES will see that his plan differs from that recently patented, in having a stipple upon the face. PROVINCIAL sends an example of a medallion portrait, in which the tinted margin round the medallion possesses a grain. The picture is very nice, but quite distinct from that under discussion. A GREAT INVENTOR, in a "chaffing" letter, welcomes Mr. Brown into the honourable family of patentees, whom he regards as beneficent martyrs. He says:—"They spend arduous days and restless nights to devise something for the good of the community, well knowing that they are certain to be pelted, and very uncertain to be paid. Whatever the invention may be, they cannot escape calumny and hatred. If the invention be a simple matter, it is too trivial to be patented; if an elaborate affair, it will be found too complex to work. Whatever it may be, it will be found to be old, or useless, or impossible, or unnecessary, or all these. Mr. Brown, having once been nearly becoming a great inventor, has done it now, and become, if not great, at least an inventor, in for all the penalties, whether he secures any of the immunities or not." J. H. B., having, as he is satisfied, practised Mr. Brown's patented method for years, asks if Mr. Brown will, in such case, forego the licence fee. Our correspondent had better write and ask him, as we have no information.

R. F.—Old varnished plates, unless very thoroughly cleaned, often give dirty negatives. As a rule we prefer new glasses to the most carefully cleaned plates. Mr. S. Bottone gives the following good advice in the *English Mechanic*:—"The very best way to remove varnish and films from old negatives is by placing them in a dish and pouring over them nearly boiling water. In a few minutes all the films will leave the glasses. A thorough wash in a stream of warm water, drying on a soft cloth, and rubbing over with sulphuric acid, applied with a cork, will remove every trace of stains. Of course the plates must be again rinsed after this application. Putting plates in potash or soda lye, especially if they remain any time in the solution, corrodes the glass, and produces irremediable markings."

POSITIVE.—There used to be a strong prejudice amongst positive workers in favour of cyanide, as giving whiter images than hypo; but a good positive, rightly exposed and developed, when fixed with hypo, possesses a pleasant creamy-white tint, which is even better than the tint left by cyanide, which is dangerous to leave on the premises, as well as in all ordinary cases unnecessary. 2. Prevention is better than cure; but it is as well to know something of the matter. We have often published details, but will briefly repeat them for your benefit. The action of cyanide of potassium as a poison is generally so rapid that remedies are of little avail. They should be applied immediately to be of any service at all. Ordinary iron developing solution might be given with advantage. If all the materials were at hand, the following is the best remedy:—Dissolve seventy minims of perchloride of iron and fifty grains of protosulphate of iron in an ounce of water. This would be a sufficient antidote to a drachm of cyanide, and if administered immediately might save life. The reaction between cyanide and the iron solution produces prussiate of potash, which is harmless.

G. D (Horsham).—The case is one for a solicitor. The point is a legal one, on which we cannot offer an opinion.

PERPLEXED.—It is quite possible that your distilled water may be at fault, and contain traces of organic matter. Water distilled by provincial chemists—who use the still for many purposes besides distilling water—is occasionally so. Permanganate of potash will purify it. Make a ten-grain solution of the permanganate, and add a drop or two to the water to be tested. If organic impurities be present, the pink tint which was first imparted to the water will gradually disappear, and the water will appear white and clear. Again add a few drops of the permanganate solution, repeating the process so long as the clearing process goes forward. The presence of a permanent trace of the pink tint is the evidence that all the organic matter present has been oxidized, and this tint may be removed by adding a little more of the water which has not been treated.

J. H. W.—Thanks for details of development, &c., duly received. The examples from your last tour are very good indeed, and some of them very charming. No. 7 is one of the best, as well as one of the most difficult. The perfect rendering of distant snow-capped mountains with dark foreground objects presents great difficulty, as a rule, to the dry plate worker. No. 6 lacks a little brilliancy and detail in the shadows. No. 4 is very good, and the rest present a fair good average. Thanks for further copy of the Château of Chillon. We shall esteem it a favour if at your convenience you will let us have the two prints of Chillon unmounted. In the course of a few weeks will serve, as we shall be from home for that time.

Several correspondents in our next.

The Photographic News, August 4, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The New Regulations Respecting the Photographing of Criminals.

To prevent "unnecessary expense," the Government, we are told, have given orders to discontinue the photographing of criminals in prisons, except in such cases where it is distinctly specified that such course shall be pursued. In a word, the Prevention of Crime Act of 1871 is to be so far repealed that instead of every convicted prisoner being subjected to the inquisition of the camera, only the convicts in certain classes particularly specified will undergo such ordeal. If there is to be any material alteration in the number of prisoners hereinafter to be photographed, we cannot help thinking that the change is hardly a beneficial one, for it must be clear to all that the registration of portraits of all those who are confined in our prisons must act beneficially in regard to the reduction of crime. No doubt a class does exist, so callous and hardened that they scarcely care what they undergo; but to the great majority of prisoners the circumstance that a carefully executed portrait of them exists at all the principal gaols about the country, supplemented by an accurate and detailed account of themselves, must perforce have a most marked influence upon their future behaviour. Indeed, as we have frequently pointed out in these columns, it would be better to use the camera more, rather than less, in connection with our criminal and legal institutions. To talk of "unnecessary expense" when discussing criminal photography is somewhat cheeseparing economy, for we do not suppose that more than two or three shillings is ever spent over the portraiture of any one criminal. We do not know what is actually the contract price per head allowed to professional photographers who may engage in such work, but it is not likely to be very high, while in most cases it is one of the warders who acts as photographer, and receives a slight addition to his stipend for undertaking the extra duty. In any case, therefore, we cannot see how the question of expense can enter seriously into such a matter; and, from the fact that, beyond being a salutary preventative of crime, it affords the best and only trustworthy manner of registering a criminal, one would think that the few shillings expended upon such an important matter was anything but an "unnecessary expense." It has been argued, we know, that the criminal portraits that are taken are not always reliable, and this we are quite willing to admit. Occasions do happen when the photographer has not caught the prisoner at the right moment, when an inexpressive side of the face has been secured, or when the sitter has tricked the portraitist with a grimace at the moment of exposure. But this occurs very seldom, and those accustomed to the production of photographs of criminals will tell you that it is well-nigh impossible for even the most wily prisoner to dupe the photographer. So many opportunities present themselves for capturing a lame duck, an old proverb tells us, and photographers of criminals are sure to get their opportunity if they only watch for it. Many a time has a prisoner assumed a knowing look under the impression that the exposure is going on, the operator standing by, watch in hand, gravely counting the seconds; but it is when the prisoner believes the affair to be all over, and is congratulating himself upon the success of his deception, with a knowing leer, that the instantaneous shutter inside is lifted, and an unmistakable sketch secured. We have printed in these columns, as our readers will remember, several experiences of prison photographers, and it was surprising what a very little *finesse* was necessary to overcome the shallow artifices of prisoners. One very good trick was to set up a sham camera in the yard, and while pretending to take a portrait, fire away at the prisoners in waiting from a masked battery that had been carefully concealed from view. In one way or another portraits of refractory prisoners are, it appears, very speedily taken, the commonest method of all, that of depriving the prisoner of food until he consented to the ordeal, being, perhaps, the most instrumental. It is not often that one can be mistaken in a man after seeing his portrait; for although a criminal when "wanted" usually grows a beard, and carries hair wherever it will screen his face, it is the eyes, the markings of the forehead, and the set of the mouth, more than anything else, that proclaim the likeness. Instead of sending down a couple of warders from London to identify some prisoner a couple of hundred miles off, as was the case years ago, it has been customary of late to forward simply the man's prison portrait, together with a description of him, and these usually prove quite sufficient to identify him. One can scarcely understand, therefore, the talk about "unnecessary expense" as regards photographing criminals, seeing that in a case like this a great saving must accrue in the matter of travelling expenses. No doubt the collection of criminal portraits made since the commencement of the regulations is growing somewhat large; but it would require but little discretion to cut the same down, from time to time, as years go on, and criminals disappear or grow out of knowledge. In fact, it would be very well indeed if the Home Office would exercise a little more supervision in the matter of photographing criminals, and issue written instructions, properly drawn up, for the guidance of those who are employed in the work. We have seen some very fine examples of criminal photography; but there have also been some truly indifferent results placed in our hands. Two views might be taken of every criminal—one rather more profile than the other, and the pictures should be secured always lighted up in something after the same manner. Certain proportions should be adopted, and only under exceptional circumstances should vignette pictures be taken. We hardly think Government is right in circumscribing the aid which the camera can render to justice; we would much rather have seen a more extensive use being made of such a trustworthy means of record as photography has proved itself to be.

OBSERVATIONS IN THE TYROL.[*]

BY H. BADEN PRITCHARD,

Author of "Beauty Spots of the Continent," &c.

The second portion of my journey, which has led me among the famous Dolomites, has pleased me more than the first. All who have travelled in Switzerland and the Tyrol are pretty well acquainted with snow and glacier scenery; and although the high passes in the Alps may differ somewhat from one another, all the snow-fields and streams of solid water have something in common. I do not wish in any way to under-estimate the charming "Oetz Thal Ferne," a glittering region of snow crystals, nor the high-alp scenery around the Gross-Glockner and Ortler Spitz, with which I am tolerably familiar; but to all their beauty I prefer the magnificent panoramas of the Groedner Thal.

My experience of the Dolomite region was previously limited to the Ampezzo Thal, a dark forest region, out of which the silvery crags raised their needle-like pinnacles. In the Groedner Thal, whence I am now writing, the wild woods are replaced by undulating pasture land, and you have the same grey crags rising straight from the grassy meadows. It is upon soft green English landscapes that the eye rests in the Groedner Thal, and in contrast with the verdant hills are the magnificent Dolomite peaks, rugged and grey in the morning light, or bathed in gold and purple haze at sundown. There are few châlets hereabouts; the valley is prosperous, and shining white cottages and slender green church spires deck the grassy slopes. Instead of the rough roofs of bark and big stones, seen throughout Switzerland, the dwellings are covered with brown tiles, and these harmonise well with the green verdure of the landscape and the shining pinnacles beyond.

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[*] Continued from page 356.

The prosperity of the Groedner Thal is due, for the most part, to our own little children. All those wooden dolls, jointed in arm and leg, which are to be purchased in London for a farthing apiece and upwards, are made in this district, and as many as five tons of toys a week are sent down the valley. The toy-makers earn something like three florins a day at their work, or, in other words, quite three times as much as ordinary labourers, and hence they and their families are a well-to-do class.

There are, however, some difficulties in the way of visiting the Groedner Valley and the Ennerberger Thal, which lead into one another. Only at one spot in the first valley is there any tolerable accommodation to be secured, while in the Ennerberger Vale there is not a pot-house worthy of the name. Again, although the latter valley is but three German miles long, the inhabitants speak three different languages—Italian, German, and Romansch; and one need be a very good linguist indeed to make way under such circumstances. By going a little out of the way towards Italy, however, you reach this place, which may be regarded quite as an oasis in the desert by the tourist in search of a good meal and a comfortable night's rest.

As I was unwilling to make a forced march along the valley in one day, I bethought myself once more of my friends the priests, and determined to seek shelter at one of their houses. My idea turned out a singularly happy one, for at the little village of Stern I was welcomed by a kindly clergyman, who turned out to be an amateur photographer. He received me in the most enthusiastic way, and we talked photographic difficulties for a couple of hours. His delight at beholding my little camera, my Alpine staff, which served as tripod, and, above all, my roller dark slide, was refreshing to behold. Far removed from any town or communication with other photographers, he had never seen a dry plate, and his means were too limited to permit of their preparation. As to the long band of sensitive tissue which I carried with me in the dark slide, he never ceased extolling its wonders. Englishmen were ever in the van with new discoveries and improvements, he protested, and it would be a long time before the simple arrangement I carried would penetrate into his country. I then, to his surprise, told him that the improvement was not due to an Englishmen at all, but, in a word, to a countryman of his own, M. Warnerke, through whose aid I was enabled to show it to him.

We proceeded soon afterwards upon a little excursion together, and between us we secured three or four views of the little village with its primitive church, myfriend doing his full share of the work. His dark closet was situated at the back of a large bee-house; we went in by one opening and the bees by another. Some little pictures he had taken of Corvara were very successful and I came away with one of them in my pocket.

The Tyrol can never be as much travelled as Switzerland until it is better provided with inns and hotels. Unless one is satisfied with a simple meal of baked veal and salad, and eggs and pancakes, one should not venture into these regions. The red Tyrol wine makes, however, some amends for the frugality of fare, and this, with a piece of new rye bread and butter, constitutes a capital lunch. Again, the traveller must know something of German and Italian, French being of no more service to him than English in the unfrequented Tyrol valleys. For this reason it is that nearly all the travellers one meets are German and Italian, and from the day of my leaving Munich to the present time I have not fallen in with a single Englishman. Only at one inn, indeed, did we come upon traces of one who had travelled this year, and he had crossed the Oetz Thal Glacier a week or two before us. The consequence is that the living is exceedingly reasonable, four to five shillings a day being pretty well the utmost one can spend. At one inn that I visited in the more frequented part of the Tyrol—the Puster Thal—where twenty or thirty pensionnaires sat down to dinner and supper, I was charged but one shilling and fivepence for three excellent meals, and tenpence for my bedroom for the night, the price of a capital red wine being eightpence the litre. In this case, too, my friends and I were known to be English.

I am now facing homewards, and hope to be back in England but a few days after this letter. I return over the Brenner, and shall probably sleep at the old posting-house at the top of the pass, so as to get a cool night's rest to prepare me for the hot run across the Continent. You can now reach London in thirty-six hours from Munich, I find; and in this weather it is always best, I think, to get over one's railway journey as rapidly as possible.

Corvara, July 20.

PHOTOGRAPHY IN CONNECTION WITH THE OBSERVATION OF THE TRANSIT OF VENUS AT ROORKEE.

BY CAPT. J. WATERHOUSE, ASSISTANT SURVEYOR-GENERAL OF INDIA.

The following complete account of the photographic observations in connection with the Indian observations of the Transit of Venus was read before the Asiatic Society of Bengal. We were favoured with the copy some time ago by Capt. Waterhouse, but have been compelled through the pressure on our columns to defer its insertion. We now find space to preserve it as a valuable record for future reference:

In December last I communicated to the Society a brief account of the proposed arrangements for observing the Transit of Venus at Roorkee, drawn up by Capt. W. M. Campbell, R.E., and although the popular interest in the subject has now somewhat worn off, a description of the operations connected with the application of photography to the observation in India of this very important astronomical event may not be without interest to the members of the Society, and, as a record of experience gained, be useful on a future occasion.

Object of Photographic Observations.—Without entering into the consideration of the astronomical problems involved, it may be briefly stated that the object in view in making photographic observations of the Transit of Venus was to obtain a series of images showing, with the utmost attainable accuracy, the exact relative positions of the planet and the sun at carefully noted times during the progress of the Transit at the different stations of observation; so that, by combining these photographs, the path of the planet across the solar disc might be accurately determined and the solar parallax be estimated by comparing the paths thus deduced for different stations. It was further proposed to endeavour to secure a graphic time-record of the exact moments at which the internal contacts of the planet and the limb of the sun took place, by means of an arrangement enabling a large number of photographic pictures to be taken on a single plate at intervals of a second or so, just about the time of contact. It was anticipated that results of the highest possible value and reliability would be obtained if photographs sufficiently exact to allow of minute micrometrical measurement could be secured, as such photographs would form a permanent and indisputable record, entirely free from the errors and imperfections inseparable from personal observation, and have the further advantage that they might be examined at leisure, and, if necessary, carefully compared by several independent examiners. How far these anticipations have been fulfilled still remains to be seen; but as several hundred photographs have been obtained in various parts of the world by different photographic processes, and with dissimilar instruments, sufficient data will probably have been gained to test the value of photography for observations of so delicate a nature, and, if this is satisfactorily proved, to show by what methods it may most successfully be applied.

The superintendence of the official arrangements for the observation of the Transit in Northern India was entrusted to Colonel Tennant, R.E., who has done so much to further the progress of astronomy and solar physics in this country, and was one of the first to recognise the value of photography as a means of recording the Transit. He selected Roorkee in the N.W. provinces as his station of observation, partly on account of the great advantages to be gained by the proximity of the canal workshops for setting up the observatory and the repair and adjustment of instruments.

Photo-heliograph.—It was arranged that photographic observations should form part of Colonel Tennant's programme, and that with this object he should be furnished with a photo-heliograph by Dallmeyer, of the same construction as those supplied to the English and Russian expeditions. These instruments were on the same principle as the photo-heliograph designed by Dr. Warren de la Rue for the Kew Observatory, and consisted of a telescope combined with a photographic camera, equatorially mounted, and driven by clockwork. According to a description given by the maker, the object glass was four inches in diameter and sixty inches focal length, corrected to combine the chemical and visual foci. The image of the sun formed at the principal focus was about half an inch in diameter, and was thrown on to an enlarging combination by which an enlarged image, about four inches in diameter, was projected on to the sensitive photographic plate arranged as in an ordinary camera. A little in front of the enlarging lens was a slide pierced with two circular openings, one fitted with spider-web cross-lines, and the other with a glass plate ruled with a fine reticule of squares, and capable of adjustment so as to be brought into the focus of the object-glass in order that the cross-wires and reticule might be enlarged and brought to fine focus at the same time as the image of the sun. The pictures could thus be taken with the cross-wires, which served as a reference mark for measurements in connection with the declination and right ascension circles, or with the reticule, by means of which any optical distortion caused by the secondary enlargement of the image could be measured.

The quick exposure of the plates was effected by means of a shutter sliding between the cross-wires and the enlarging lens, in which position the object could be effected with a minimum of motion. This shutter was held at its lower end by a spring, and was arranged so that when raised to its full extent, by means of a string attached to its upper end, the passage of the solar rays to the sensitive plate was cut off. This string passed over a pulley on the body of the instrument, and had at the end a hook on which a loop of strong cotton thread was attached, and, being stretched so as to pass over a conical block fixed on the camera, retained the shutter in its raised position. When the thread was cut, the force of the spring immediately drew down the shutter, and allowed a momentary exposure of the sensitive plate to the solar rays during the passage of a slit in the shutter, the width of which could be increased or diminished at will from *nil* to ·5 of an inch by means of another slide worked by a screw connected with a graduated scale. The rapidity of motion of the shutter could also be regulated by increasing or diminishing the tension of the spring by means of a screw.

When the shutter was down the solar rays were quite cut off; but by a simple arrangement a circular aperture above the exposing slot could be brought into a position concentric with the axis of the telescope, thus permitting the whole bundle of rays to pass uninterruptedly through the camera, and enabling the image to be examined for focussing, &c.

The camera of the photo-heliograph was constructed to take plates six inches square. The position of the image on the plates was regulated by means of a finder fixed on the outside of the telescope tube, and consisting of a lens throwing an image of the sun upon a screen made of talc, covered with paper, and adjusted so that when the enlarged image was in its proper position on the ground glass of the camera the finder image just filled a square, ruled on the talc screen.*

To be continued.

A LECTURE ON LENSES.

BY JOSEPH ZENTMAYER.†

So far we have considered a ray of light, reflected by a transparent medium, to be still a single ray. Such would be the case were the white ray of light of a single homogeneous colour; but what we call white light is composed of different coloured rays, which by passing through a refracting medium, are refracted in different degrees. This is the source of another aberration of even more importance than the spherical aberration—the chromatic aberration. By passing a beam of white light B (Fig. 16) through a prism, it is not only refracted, but decomposed into seven colours, red, orange, yellow, green, blue, indigo, and violet. These different coloured rays are differently refracted by the prism. The violet ray, as the most refrangible one, is refracted towards V, and the red one, as the least refrangible, is refracted towards R, and other coloured rays fill out the space between V and R in the order of their refrangibility. This is known as dispersion. The dispersion of refracting medias is measured by the length of the spectrum which they produce. Flint glass has more dispersive power than crown glass, because the spectrum which it produces is longer than that of crown glass. The dispersion of a medium is indicated by the difference of refraction between the index of refraction of the red and the violet. Let us now see what effect the dispersion has on images produced by single lenses.

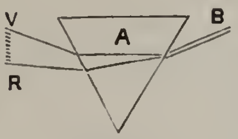
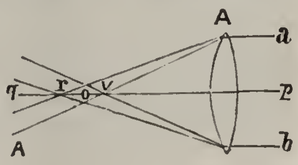


Fig. 16.

White light *a* and *b* is falling on a double convex lens (Fig. 17). The ray *a* is decomposed into the different coloured rays as soon as it enters the lens, and the red ray, as the least refracted, will cross the axis *p q* in *r*, while the violet ray crosses the axis in *v*. Between the red and violet the other coloured rays cross the axis. The same is with the ray *b*, and if we do not consider the spherical aberration of the rays between *a* and *b*, all the red rays will have their focus at *r*, and all the violet ones at *v*. Between *r* and *v*, the foci of all the other coloured rays are situated. The space between *r* and *v* is called the longitudinal, chromatic aberration. The length of the aberration changes with the dispersive power of the media, out of which the lens is made; it is, for instance, twice as great if the lens



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* The screen originally supplied with the instrument was of parchment but as this was found to expand and contract with the variations of moisture in the air, it was advantageously replaced by the talc and paper screen.

† Continued from page 340.

is made of flint glass as if the lens were made of crown glass. The influence of the chromatic aberration on the image of a lens is shown in Fig. 18. The white light from the object *a b*, refracted and dispersed by the lens A, does not form a colourless image at *f f*′, but the red rays form one at R and R′, and the violet at V V′. But between these an endless number of coloured images of rays of different refrangibility are produced. The red image is the largest. If we place a screen at R R′ we do not get simply a red image, as all the other dispersed images are formed on the screen; and as the mixing of all the different colours of the solar light make white light again, so the mixed images, that is, the central part is colourless, and only the margin is blue, because it is surrounded by the diffusion image of the blue diverging rays.

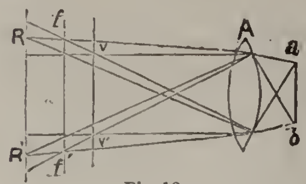

Fig. 18.

If the screen is moved to V V′, then the image is surrounded by a red margin; if it is moved to *f f*′, the coloured margin disappears, but the image, composed of the different dispersed images, appears undefined and not clear. This effect is more increased because each coloured image has its spherical aberration also. Chromatic aberration alone would place the different coloured images in regular succession behind each other, but spherical aberration mixes these images of different colours, and only the two outer ones, red and violet, remain. From the foregoing it is clear that chromatic aberration must necessarily interfere with the definition of a lens, and that it is desirable to find a way to correct this evil. From the moment when Newton unravelled the nature of solar light, proving that light is composed of rays of different refrangibility, our greatest philosophers and opticians have spent their time and skill in the attempt to produce lenses without chromatic aberration, or at least to reduce it to a minimum. Sir Isaac Newton was of the opinion that refraction and dispersion of different refracting substances are always in the same ratio to each other, and concluded that it was hopeless to produce refraction without colour, by combining convex and concave glasses. Leonhard Euler, the great mathematician, on the other hand, reasoned in another way, and this is a curious instance of how a correct conclusion was drawn from false premises. He assumed that the human eye is achromatic, and consequently a lens could be made achromatic too, and Newton must be in error; he constructed theoretical rules for making achromatic lenses, and Dollond, the optician, succeeded in carrying them out. But Dollond, by comparing the eye with his lenses, observed that the eye cannot be achromatic, and Fraunhofer afterwards measured the chromatic aberration of the human eye, and found that an eye that is able to bring parallel rays of red light to focus on the retina, can only bring violet rays to a focus, coming from a distance of two feet.

Now let us see how we get rid of these beautiful colours, which we admire so much in the rainbow and the glittering dewdrop, but which hurts the eye of an optician, in an optical instrument. If a ray of white light, R (Fig. 19), falls obliquely on a parallel plane glass, it is decomposed as soon as it enters the glass; but on the other side all the coloured rays which made white light, are, on leaving the glass, parallel to its former direction, and if we think the whole surface of the glass struck by white rays, they all will be dispersed, and come out parallel on the other side; but if the different coloured rays are mixed homogeneously, it makes white light again.

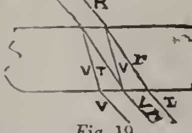

Fig. 19.

But if a prism, A (Fig. 20), is struck by an oblique ray, R, the ray is dispersed in the glass and the coloured rays leave the prism diverging, and they cannot be properly mixed again to white light, except we can give to the leaving rays their parallelism again. Now, if we combine a prism, B, of the same angle and material, in a reversed position to A, it is evident that we restore the diverging rays again to parallel rays; but unfortunately we destroy not only the dispersion, but also the refraction; we make a thick parallel glass out of the prism.

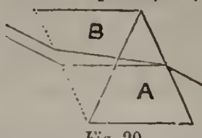

Fig. 20.

Let us try it in another way. The ray, R (Fig. 21), passes into a prism of crown glass, A, and a coloured image would be formed at *s t*, if the prism B would not interfere. If we now could combine with the prism A, one of a less angle, but made from material like flint glass, of greater dispersive power, so as to have the same dispersive power as the larger angle prism A, we can restore the diverging into parallel rays, and the light will come out white again, although it went through the compound prism C D E. This is perfectly practicable, if we make the prism B of flint glass; this having a greaterdi spersive power than the crown glass, and the rays *c* and *d*, when entering the prism B, are somewhat refracted—the violet more than the red—and their divergency is smaller; and if the prisms have the right proportions, the red and violet rays come out into the air parallel, and at the same time the rays passing from the prism B will have a different angular direction than that with which they entered the prism A. Thus we have refraction without dispersion.

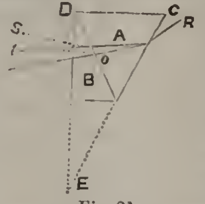

Fig. 21.

Let us adapt this principle to a lens, A (Fig. 22), made of crown glass. The rays *a* and *c* enter the lens at *b* and *d* and are dispersed; the red would cross the axis at *r*, and the violet at *v*. We associate the plano concave *c*, of flint glass, with the lens A. As the negative flint lens is of a denser medium, the violet, as well as the red rays, will be refracted, but the violet more so than the red: and, if form and dispersive power of the two lenses are in the right proportions, the red, as well as the violet, will meet at the point *f*; the image formed there is colourless, or achromatic, or, in other words, it will appear in its natural colours. But even in the best achromatic lenses there is still a small amount of colour left which cannot be destroyed. If we compare the spectrum of a prism of crown glass with one of flint glass of the same angle, we find that the more refrangible blue, indigo, and violet, take not only absolutely, but also relatively, more space than one in the spectrum of the crown glass prism. So, if we succeed in uniting the outer rays, red and violet, the intermediate colours cannot unite completely, and this remainder of not corrected coloured rays we call the secondary spectrum. Complete achromatism, therefore, cannot be obtained, but we must be content to come as near as possible to the requirements. A selection of crown and flint glass, in which the proportion of length of the spectra of the different rays are nearly related, will bring us very near to our purpose. Fortunately, the colours of the secondary spectrum are feeble, and do not interfere much with the sharpness of the image, and we are well pleased if a lens exhibits only the secondary colours—light purple and greenish, as it is a proof that the most objectionable effects from chroma

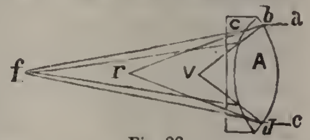

Fig. 22.

tism are removed. The association of flint and crown glass serves not only to correct chromatic aberration, but, as we have seen before, if the right form for each of a pair of lenses be selected, it corrects spherical aberration also. Such a lens, corrected for spherical and chromatic aberration, we call an *aplanatic* lens.

To be continued.

NOTES ON PHOTOGRAPHY, HISTORIC AND DESCRIPTIVE.

BY CAPT. ABNEY R.E., F.R.S.*

We next pass on to other applications of the dichromates for the production of prints, and the first I shall demonstrate is that known as carbon printing, but which is, perhaps, more correctly termed the autotype process. It is dependent on the oxidation of gelatine, one of the substances which you may have already guessed would be capable of being acted upon by the dichromates. If, then, we have a film of this gelatine impregnated with potassium dichromate, and after drying it be exposed to light, it will be found that all the portions acted upon will become insoluble in hot water; that is, supposing the duration of the exposure be of sufficient duration, and if the light be sufficiently intense. Imagine now that beneath a negative of delicate gradations of light and shade, we place a film of sensitive gelatine, supported, for convenience sake, on paper, and allow sunlight to act upon it. After a time, in what condition will the gelatine be? It will be partially insoluble, more particularly on the surface next the negative, and the lights and shades will be represented by different depths of insoluble matter, according to the intensity of light penetrating through the various parts of the negative. I must here pause, and try and explain why this is. At first sight it might seem that the *whole of the thickness of the film* ought to possess different ratios of solubility. This is not true, however; the solubility is affected to different depths. That coloured component of white light which is principally effective in producing the chemical change is blue, and which, consequently, finds a difficulty in piercing through the orange-coloured dichromate. The amplitude or height of the blue wave is continually diminished, till finally it is almost extinguished. Now the intenser the white light the greater will be the original amplitude of this wave, and it is at once apparent that the limit of amplitude, which is effective to cause the chemical change, will be reached at a greater depth by those rays of light which were originally the brightest. A little reflection, then, will show you that the soluble part of the gelatine will principally be next the paper, and on immersion in hot water the viscous unaltered gelatine would remain imbedded between it and the outer insoluble surface. Though several ingenious methods have been tried to render the support on which the gelatine rested sufficiently porous to allow the occluded parts to be washed away, yet, so far, no attempt has been completely successful. To get over the difficulty, the principle has been adopted of transferring the gelatine film to a temporary support, the outside surface being caused to adhere to it. Evidently, by this means, the soluble gelatine can be washed away when the paper is peeled off, and a raised image insoluble in water would remain, which eventually may be transferred to its final support. The temporary supports usually employed are metal plates, glass, paper coated with an insoluble compound, &c. A picture in gelatine alone, however, would be, comparatively speaking, of little value, as it is almost colourless; but if pigments be mixed with it the objection disappears. In the autotype process the gelatine is mixed with colouring matter, and a coating is given to a piece of paper. When dried the gelatine can be rendered sensitive by floating its surface on a solution of potassium dichromate, and after again drying, is ready for printing. Such a piece of prepared paper, or carbon tissue, as it is technically called, we have here. It has already been exposed beneath a negative, but no trace of any image is apparent, as the dark colour of the pigment masks it entirely. In order to judge of the amount of light received during exposure, resort then is had to what are called actinometers. The detail of the instruments I will not enter into; suffice it to say it is usual to judge the depth of printing by the colour given to silver chloride. Placing then the exposed tissue, gelatine side downwards, beneath water in which a zinc plate has already been immersed, and bringing the surfaces of the two together, they are withdrawn from the water with a film of moisture between. You will notice that I left the print in the dish but a very short time, for a reason which you will presently understand. By passing this "squeegee" (which is a bar of wood from which a thick strip of india-rubber projects) over the back of the paper, I drive out all the water from between the surfaces, and you see how the gelatine film clings to the zinc. And why is this? You will find that it is not naturally adhesive; the light has changed the quality of the gelatine in this respect; then why does it hold so tight to the metal plate? Simply owing to the moisture left in the paper; the soluble gelatine soaks it up and expands. It cannot well expand laterally, so it expands upwards, and a partial vacuum is created between the gelatine and the plate. Now you see why I left the print in the water such a short time. Had I left it in longer the total expansion would have taken place, and the necessary vacuum could not have been created when it was pressed on to the zinc plate.

Now that it is firmly held, I can place it in hot water and remove the paper. It easily peels off, and the solvent action of the fluid can have fair play. As I move it up and down in the trough, you can see the gelatine running over the surface. After a few minutes it is clean, and the development is finished. On this plate I have another print whch has already undergone similar treatment, but has been allowed to dry. This piece of transfer-paper is now heated in very hot water, and applied to the surface. It is "squeegeed" on to it, and you see it adheres, this time, however, by its "stickiness." Here is another print in the same stage, but the adhering paper is dry. Raising one corner of it by my nail, I can grasp it in my fingers, and the finished print strips off the plate held in position by the paper.

Such are the usual manipulations in autotype printing, and the pictures produced by this method should be permanent, and they must be as permanent as leather, or as the pigment which is employed to give visibility to the gelatine image. As I mentioned before, there are various modifications of the process; for instance, one is to develop the picture on the permanent support destined to bear it, using this instead of the zinc plate. A little consideration will show you that in this case the negative employed must be reversed.

(*To be continued.*)

Production of Silver in the Whole World.—According to recent statistics, the production of silver in the whole world in 1800 was $35,000,000, which rose in 1850 to $42,500,000, in 1854 to $47,500,000, and in 1865 to about $62,500,000. The production of this precious metal during the year 1873 is subdivided as follow: England and its colonies, $10,000,000; Norway, Sweden, and Denmark, $250,000; Russia, $500,000; Austria, $1,620,000; Germany, $3,000,000; France, $2,000,000; Spain, $2,000,000; Sardinia, $500,000; Mexico, $20,000,000; Central and South America, $8,000,000; Canada, $900,000; the United States, $36,500,000: which gives a total of $85,250,000. Including the year 1873, it is estimated that the total production of silver, since the discovery of the New World by Christopher Columbus, has been $715,000,000, the largest source of accession during late years being due to the Nevada mines.—*Scientific American.*

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* *Nature.* Continued from page 351.

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The Photographic News.

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THE USE OF PHOTOGRAPHS FOR ENGRAVING AND PUBLICATION.

One of the minor forms of spoliation to which photographers are sometimes subject is the unauthorized and unacknowledged use made by illustrated periodicals of photographic portraits and portrait studies. The law of copyright, it is true, provides a remedy for the wrong; but as it is perhaps frequently more annoying than damaging, and the remedy is cumbrous and troublesome, few care to avail themselves of it. There seems to be a curious indisposition on the part of the art supervisors of many illustrated papers to acknowledge a photographic origin to the pictorial work appearing in their pages—based upon what principle it is hard to understand. We are reminded of this disposition by some apt remarks, serious enough, in a contemporary usually devoted to fun. *Funny Folks* has the following paragraph:—

"It has been remarked as curious that the *Illustrated London News* should have had no portrait of the late Colonel Richards, seeing how usual it is for that journal to give the 'counterfeit presentments' of men of the time as they pass away. The reason is still more 'curious.' There were few portraits of Alfred B. Richards, but one of the best was a photograph by Valentine Blanchard, executed for one of the literary clubs. The use of this was applied for, and was readily granted, on condition that the *News* stated that the portrait they gave was from this portrait, the property of the club. That condition was declined. Why? Surely if a photograph is worth engraving, it is worth the mention of the artist's name! Indeed, in a case of this sort, *noblesse oblige:* a paper owes the courtesy to *itself;* but the whole matter is 'curious.'"

The matter is certainly "curious." In this case, however, there is no wrong to the photographer; the emphatic statement of the conditions of acknowledgment led to the abstention from publication, and the public lost an interesting portrait. The photographer is not always so fortunate. It too often happens with many journals that a photograph is considered legitimate game for copying—sometimes literally, sometimes with modification—without any thought of acknowledgment. A case occurred some time ago in which application was made to a photographer for a print with the avowed object of engraving in an illustrated journal. The print was at once forwarded, with the condition that the photographer's name should appear in conjunction with the engraving. This condition was disregarded; upon which the photographer sent in a bill for three guineas for the use of his photograph. This was, as he anticipated, demurred to; but a firm and courteous intimation that he was prepared to enforce his claim secured payment of the amount.

DR. VOGEL ON THE PHILADELPHIA EXHIBITION.

Dr. Vogel, the president of the Berlin Society for the Advancement of Photography, who is at present at Philadelphia, has sent home the following preliminary report:—

The day before yesterday I arrived safely at Philadelphia, and I have, therefore, been able as yet to devote but a single day to a cursory examination of the Exhibition. It is impossible, therefore, for me to give but a brief sketch of the International Collection.

The Exhibition is a grand one; it embraces a mass of objects worth seeing, and everything is set out with great skill, and with a happy knack of utilising such facilities as exist. The main building, a simple structure of wood, has cost much less to erect than that at Vienna, while it has a much better appearance, both within and without. It consists of a middle nave, and two side naves, provided with a superabundance of light. The whole arrangement of the place is so good and tasteful as at once to take the fancy of the visitor. At Vienna it was only the places in the rotunda and principal nave that could be considered favourable ones, those in the cross naves being far less satisfactory. In the Philadelphia building there is no difference of this kind met with.

America, as a matter of course, takes up most of the space.

The German department is again the one of all others which makes the least favourable impression upon the visitor. Most of the objects are purely commercial in their nature, and in part, beneath consideration. The German exhibitors seem to have regarded the Exhibition as a sort of fair or market, rather than as a collection to which everyone should contribute his best. There is much left to be desired also in the way the objects have been arranged. It is pitiable that Germany has cut such a sorry figure at all these International Exhibitions. Cheap and nasty, says the *New York Sun*, is the motto that should be written over the German department.

It is a blessing that this motto does not hold good in respect to the photographic objects contributed by Germany. This section of the Exhibition redounds to the honour of German photographers, and the manner in which the exhibits have been disposed is also remarkably satisfactory, none of the good things forwarded having been wantonly thrust into a corner or put out of sight.

The arrangement of the building and its exterior is already well known. On the day of my departure I received a note to the effect that the Exhibition was still very much behindhand, but on my arrival I found everything finished, and the greater part of the pictures already hanging in their places. The exterior is more simple than it was designed to be, perhaps on account of economy; but the interior leaves little to be desired. Excellent lighting everywhere, partly from above and partly from the side, too much rather than too little. The walls are painted of a Pompeian brown, so that the pictures show with effect. The division of space is exceedingly well managed, and altogether Mr. Carbutt, who has had the supervision of the department, deserves the heartiest thanks of the exhibitors.

Of all foreign nations the Germans are best represented in the matter of photography. France and England have sent but few objects for exhibition, and of these the most has not yet been unpacked. It is a great evil, however, that a large number of exhibitors have their works shown, not in the photographic department, but in the main building among thousands of other objects. Thus Römler and Jonas, the Photographic Society, and others have found a place in the book department. Had they given earlier notice of their intention to exhibit, they might have had the best places in the photographic department accorded them. In the same way, some of the French photographers are to be found in the main building together with several from Italy and India, and how the jury are going to find out all of them one after another is to me quite a riddle.

The catalogue is perfectly untrustworthy, and as to the organisation of the jury, it is quite impracticable. I do not want, however, to tell tales out of school; I have seen many exhibitions in my time, and I have no doubt that I shall add to my experiences here. By way of curiosity, may be mentioned that there are two American gentlemen on the wine jury who are total abstainers, and who, therefore, not only avoid wine and spirituous liquors, but condemn their use altogether.

About the photographic productions exhibited, I cannot as yet speak. The Americans shine out both as regards the quality and quantity of their exhibits; that Messrs. Kurtz and Rocher are among the exhibitors is a matter of course. Silver prints abound, and landscape photography is more prolific than it was at Vienna. Apparatus and chemicals are present in excellent quantity. The Lichtdruck prints are not properly exhibited yet.

From what I have experienced for the past two days, and from what I learn from my colleagues, the living here for foreigners is enormously costly. By the help of my friends, I have managed to obtain so-so accommodation at a somewhat moderate rate,—viz., one and a-half dollars per day for bed and breakfast, or rather more than five-and-sixpence. The restaurant at the Exhibition which we have to patronise is atrociously dear. A beafsteak and cheese cost a dollar, or nearly four shillings; dinner, from five to six shillings. Those, therefore, who desire to pay a visit to Philadelphia should heed Iago's advice to Othello, "Fill thy purse with gold."

One of the most interesting objects of the Exhibition is the business of the Centennial Photographic Company, which has, as in Vienna, secured the monopoly for photographing the objects exhibited. The establishment of the company is close to the main entrance, in an exceedingly favourable situation, and contains a portrait studio which is busily engaged in taking likenesses and groups. The business is conducted by Messrs. Wilson, Fraser, Notman, and Adams, and produces work the excellence of which is universally acknowledged. A hundred people are engaged upon the business, and the number of exhibitors photographed every day amounts to something like six hundred and seventy-five. Such rapidity in portraiture is only possible by taking three sitters upon one plate one after the other, and working simultaneously in five glass houses. The material result has already proved profitable, although the Exhibition has till now been only visited in moderate numbers.

After a somewhat cool May, the hot Philadelphia sun is making itself felt, and a most oppressive heat is now descending upon Exhibition Square.

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DYED IMAGES BY PHOTOGRAPHY.

A patent recently obtained by Mr. Ernest Edwards introduces a distinctly new class of picture into photography, although the method employed consists in a very slight modification of a known mode of printing. The image in the new method is produced—not in silver or other metal, not in pigments as in carbon printing, not in a fatty ink as in photo-collography and similar mechanical processes—but in a dye-stuff, the image being essentially produced by dyeing or staining the paper. A printing surface is obtained by means of gelatine and bichromate exposed, not under a negative, but under a transparency. The lights of such a gelatine film are hard and non-absorbent, and the dark portions gelatinous and absorbent of moisture. A solution of any dye passed over such a surface is absorbed by the gelatine in the different degrees to which the image it contains has been acted on by light. Paper pressed into contact with such gelatine surface will receive an image in the dyeing material used, and if the paper has been previously prepared with a suitable mordant the picture remains in fast colours. It will be seen that this principle admits of extensive application for producing pictures in various fast colours, not only on paper, but other textile fabrics. The specification is as follows:—

> The object of my invention is to produce impressions from gelatine, or analogous substances, in any of the colours known as dyes as distinguished from printing inks.
>
> My invention is based on the well-known fact that gelatine, gum, albumen, fibrine, and analogous substances are ordinarily absorbent of water, but may be rendered non-absorbent by certain well-known means, such as the formation of chromic acid by the action of light upon bichromatized gelatine, or by the application of chrome-alum or tannin.
>
> In previous applications of this principle, those portions of the gelatine which by such means are rendered non-absorbent have been used by various devices to produce the print or picture. I have discovered, however, that those portions of the gelatine which after such treatment remain still absorbent may also be used to produce a print or picture by causing such remaining absorbent parts to absorb or take up a quantity of water containing in solution any convenient colour or dye.
>
> It will be readily understood that by placing paper or other suitable material on such a surface, and applying sufficient pressure, the paper or other material will receive the colour from the gelatine plate in just such proportion as the gelatine has been allowed to remain absorbent.
>
> My invention consists in producing impressions with colours known as dyes, as distinguished from printing inks, from plates consisting of gelatine, gum, albumen, fibrine, or analogous substances, which are absorbent of water; the parts which are not required to print having been rendered non-absorbent of water, or otherwise suitably prevented from printing.
>
> I will describe the mode by which I have successfully prepared and printed from such plates according to my said invention. Upon a suitable surface of metal, wood, stone, glass, or other suitable material, I place a layer of gelatine, gum, albumen, fibrine, or analogous substance, on which an image has been or is to be produced by rendering such portions as are not required to print non-absorbent of water by any of the well-known means.
>
> In preparing the gelatine or equivalent plate, I have found the following to be a convenient formula:—I take of gelatine 1 ounce, water 6 ounces, bichromate 30 grains; I dissolve the gelatine and bichromate in the water heated for the purpose, and spread the mixture upon a surface of slate. When dry the plate is to be exposed to light under a photographic positive (as distinguished from a negative). After an exposure sufficient to render non-absorbent those parts not to be printed, the plate is washed with water till all bichromate has disappeared; it is dried, and is then ready for use. In place of a photographic positive a design or tracing may be used, or the bichromate may be omitted, and a design drawn directly on the gelatine, or transferred thereto, with chrome alum. Or a design may be drawn on or transferred to the gelatine in an opaque or waterproof varnish, the portions of gelatine not covered with the varnish being then rendered non-absorbent. Or a stencil plate or mask may be used, so as to mechanically prevent the portions of the gelatine covered by it from imparting any of the solution in those parts to the paper on which the impression is to be made.
>
> Impressions may be taken from the plate prepared as above described in the following manner:—The surface of the prepared gelatine or equivalent plate is to be wetted or dampened with a solution in water of the desired colour, and the surplus moisture is to be removed by any convenient means; the paper or other material on which the image is to be printed is then to be pressed upon the surface of the plate, so as to receive a portion of the colour. As the colours to be used in this kind of printing, and known as dyes, are soluble in water, and as these colours are to be applied to the surface of the plate in solution, they will not be absorbed by the parts of the plate which have been rendered non-absorbent of water; but in the other portions they will be absorbed just in proportion as the absorbent property has been modified by the treatment which the gelatine has received. When the colours used are dyes which require mordants to strengthen the colour, the dyes and mordants may be applied in any convenient manner or order.

Care must be taken, however, to use only such dyes or mordants as do not injuriously affect the gelatine plate. The following are convenient formulas:—

1. Mordant to be applied to the paper:—Solution of protochloride of tin, 1 part; water, 9 parts. For wetting or dampening the gelatine plate, a saturated solution of extract of logwood.

2. A saturated solution of aniline purple, used alone or with a mordant, where necessary, of perchloride of tin.

3. Chloride of cobalt, 1 part; water, 10 parts. The image in this case does not appear till heat is applied; on cooling it disappears, and heat is always necessary to redevelop it.

I wish it to be understood that I do not confine myself to the above or any particular formulas for preparing the plates or producing impressions, but vary these both as regards the substances and quantities as occasion may require. My said process is also applicable to printing on fabrics and on all other material suitable for receiving the action of dyes.

What I claim as my invention, and desire to secure by letters patent, is the described process of printing from plates of gelatine, gum, albumen, and other analogous bodies, which are absorbent of water, with soluble colours known as dyes, in contradistinction to those known as printing inks, the parts not required to produce an impression having been previously rendered non-absorbent of water, and incapable of printing either by exposure to light, the application of a coagulating substance, an opaque varnish or mat, or other suitable means substantially as specified, and for the purpose set forth.

There is a somewhat curious circumstance in connection with this patent. It was entered at the Patent Office twice during last year. The first time, provisionally, by Mr. Ernest Edwards, and never completed; and again, six months less ten days afterwards, in the name of H. J. Haddan, as a "communication from Mr. Edwards."

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A GOOD EXAMPLE.

Messrs. Ross and Pringle, of Edinburgh, taking advantage of the annual holiday, on Thursday, the 27th ult., and knowing from experience the advantage derived from the occasional free-and-easy intercourse between employers and employed, carried off the whole of the members of their establishment to Loch Goil Head, determined to have a thorough change both of air and scenery. They started per Caledonian Railway at half-past six for Greenock, and after two hours' inspection of that busy town, including the shipping and the famous Iona, with its ever tourist-crowded decks, went on board the *Carrick Castle*, and sailed through the beautiful scenery to the head of the loch. After some time spent in admiring the grandeur of the scenery, and taking a photograph which is intended to be copied and used as a background for the popular boat, they sat down on the banks of the Goil, and laid the cloth under the spreading branches of a great oak.

Mr. Ross took the chair, and under his rule ample justice was done to a well selected and plentiful dinner, zest to which was abundantly given by the beauty of the rippling river at their feet, and the grand old mountains behind.

After dinner, the party strolled back to the head of the loch, and some of them indulged in the pleasures of boating till the arrival of the *Windsor Castle*, in which they embarked for Greenock, where they took the express train for Edinburgh, getting home at half-past eight o'clock, all highly pleased with the happy outing.

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ON THE THEORY OF THE ALKALINE DEVELOPER.

BY CAPT. ABNEY, R.E., F.R.S.

The rationale of the cause of visibility of the latent image in bromide of silver, when treated by the alkaline developer, seems to be but little understood. Although I have previously given an account of the theory which I hold, it seems that, perhaps, it might be more readily understood by introducing a modification, and simply treating the developer as an alkaline pyrogallate. The following experiments may perhaps be instructive, though they are of a most simple character. It is well known that pyrogallic acid absorbs oxygen, and with much more readiness when an alkaline solution is mixed with it. Similarly it will be found that it combines with bromine, and also with greater avidity when in the presence of an alkali.

If a solution of pyrogallic acid be taken, and a drop of bromine water be dropped into it, it will at once be apparent that a combination has taken place, a brown colouration being induced. (If further proof of this be required, the intense heat generated by a drop of bromine on solid pyrogallic acid will at once demonstrate that a chemical change is taking place.)

If some thoroughly washed bromide of silver (prepared in the dark) be placed in a test tube, and be taken into the light, a solution of pyrogallic acid poured upon it will produce no marked effect; but if a drop of ammonia be added, the silver compound instantly blackens. Pouring off the alkaline pyrogallate, and neutralizing it with pure nitric acid, no trace of silver can be detected; but on testing it for bromine with a solution of silver nitrate, a copious precipitate is at once formed. If the silver residue in the test tube be next thoroughly washed, and treated with nitric acid, it becomes a buff colour, and the unaltered bromide after washing will be found to dissolve up entirely in cyanide of potassium, whilst the nitric acid solution, on applying the proper test, will give evidence of the presence of silver.

Treating bromide of silver which has not been exposed to the light in a similar manner, very small precipitates will be obtained. Hence we have evidence which indicates that the sub-bromide (produced by light from the bromide) is decomposed into silver and bromine, the latter entering into combination with the alkaline pyrogallate. The greater intensity given by the strong alkaline developer over the weaker solution may probably be due to the fact that bromide of silver is soluble in ammonia, and that as fast as it dissolves up this compound the alkaline pyrogallate decomposes it into silver and bromine; and as in the case of ordinary acid development, the former is deposited on the freshly-formed crystals of silver which are due to the decomposition of the sub-bromide. When using lime, I have never been able to get the same intensity as with ammonia, however much of the base I have employed. This is due to the fact, I believe, that the bromide of silver is not soluble in calcic hydrate. Again, I have stated that density can be given to a negative by using alkaline developer with a solution of hyposulphite of silver. Density, however, also arises from another cause, which is not so explainable. If a film of silver bromide in collodion be exposed in the camera, and be separated from the glass plate, and be then superposed over another which has not been exposed, contact between the two being secured by moisture and subsequent drying, it will be found on developing the first film and separating it from the second, that in some instances the latter has a developed image on it. That this is due to a catalectic action of the freshly-formed metallic silver in contiguity to the bromide of silver below it seems possible. That the same action takes place laterally as well, there is no reason to doubt, but every reason to the contrary; and when we remember the astonishingly small thickness of the collodion film, there is nothing surprising in the action taking place through its entire thickness.

(To be continued.)

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Correspondence.

M. VIDAL'S PHOTO-CHROMIC PROCESS.

Dear Sir,—I see by your last letter from Paris that I have given umbrage to M. Lacan by my reference to the photo-chromic productions exhibited in the Paris Exhibition. If M. Lacan will refer to the News he will find I am not the only one who has taken exception to the manner in which these pictures are put before the public, for Mr. John Spiller makes some remarks very similar to mine anent the coloured photographs exhibited at South Kensington.

I have a great esteem for M. Leon Vidal. When at Marseilles, he was the life and soul of the photographic society there. He has done much hard and conscientious work in one branch and another of photographic manipulation, and his photometer, of which I possess an example, must have necessitated many months' study to elaborate. It is, however, for this very reason that I was surprised to find that any mystery was made about his photo-chromie. If the process is being worked out industrially and upon a large scale, as the enthusiastic remarks of M. Lacan lead us to believe, I heartily congratulate M. Vidal, and hope that, hardworking investigator as he has been for many years, he will be fully recompensed for his labours. Whether his invention is new or not, matters little, if he produces good work and gets paid for it. In my report to you I said if the pictures "are simply coloured lithographs, or a modification of these, covered with a photographic film, then I for one fail to see any novelty in the productions at all." It would seem from M. Lacan's letter that the photo-chrome pictures really are a species of photo-chromo-lithography, for that gentleman says:—"As to the novelty of M. Vidal's process, I should like to know how it is, if that gentleman cannot claim it, as the correspondent of the Photographic News affirms, that nobody has shown such productions before." Now I do not affirm for a moment that M. Vidal's photo-chromes are not novel; all I wished to say was that coloured impressions covered by a photographic film have often been produced, I myself remembering to have seen some ten years ago, at least.

As to the green pamphlets, which are supposed to tell us about the process, I must be pardoned if I again repeat that they hardly tell the whole truth. The pamphlet is not from the pen of M. Vidal himself, it is true; but we may fairly assume that he had the articles they contain reprinted and issued. Here is an extract from one of them. After saying that the light first of all produces a monochrome photograph, the writer, M. Paul de St. Victor, says:—"Now there exists a means of obliging the light to continue its work, by painting after a manner the image it has sketched. This method is the invention of M. Vidal. Those who believe that to photograph directly in colours will one day be discovered, may patiently await the realisation of their dream; its equivalent has been found. Instead of permitting the luminous rays to act upon black substances or substances capable of being blackened, M. Vidal utilised their action upon coloured matter of various tints, according as the subject to be reproduced is more or less rich in different colours. From the combination of the coloured matters is born a polychromic image clothed with all the tints of the original object."

Another writer in the same pamphlet gets more enthusiastic still over the process. I cannot trust myself to translate this sublime paragraph:—

"Voici donc un art nouveau. Ce qui paraissait un rêve est réalisé, le XIX^{e} siècle est décidément le siècle des inventions. Le grand Léonard de Vinci qui a tout cherché avec son œil d'aigle et son intelligence surhumaine serait bien heureux de se reveiller aujourd'hui dans notre monde, qui se transforme avec une rapidité féerique."

When I read the green pamphlet I was reminded of a humorous incident in a clever French play, "Le Voyage de M. Perrichon," which is no doubt familiar to many. M. Perrichon, a vainglorious old gentleman, travels with his daughter to Chamounix, and two young men start in pursuit in the hope of securing the young lady's hand. No. 1 saves Perrichon as he slips over a rock; but No. 2 does better—he allows himself to be saved by Perrichon. Nothing can exceed the old gentleman's delight at his feat, and he is for ever telling the story of how he drew the young man out of a terrible crevasse in the presence of the Mont Blanc. No. 2 improves the advantage he has gained, and sends a marvellous account of the bravery of old Perrichon to a newspaper (cost, five francs a line). The old man is enraptured, radiant, when he reads the paragraph. "To show my gratitude," says the would-be son-in-law, I will have a picture of Mont Blanc painted." "What! only of Mont Blanc?" asks Perrichon, in a huff. "And of you, too, of course; of you and the Mont Blanc." "Ah, ah! I and the Mont Blanc," puts in Perrichon. "And I shall have written underneath the picture," continues the young man—— "I beg your pardon," says Perrichon, suddenly becoming severe;. "I will have nothing written underneath the picture, nothing at all, save and except this simple paragraph from the newspaper."

I hope M. Vidal will forgive me, but I could not help thinking of the Perrichon incident when I found that he himself gave no particulars as to his process; all he has done is to reprint by the thousand the simple opinion of two enthusiastic friends.—Truly yours,

Your Correspondent.

VIGNETTE PORTRAITS.

Sir,—Specimens of carte vignette portraits, with stippled-in backgrounds only, were sent to the Editor of the *British Journal* in August, 1872, and were commented upon favourably by him in that journal, and these remarks were published in an advertisement in the Photographic News shortly after this date when advertising negatives for the production of the same effects in photographic portraits.

I shall be glad if you will give this due publicity.—Yours truly, David Rees.

298, *Clapham Road, London, July* 31.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN EXHIBITION, 1876.

Sir,—I have the honour to inform you that the forthcoming Exhibition of the Photographic Society of Great Britain will be opened with a *conversazione* of the members and their friends at the Gallery of the Society of Painters in Water Colours, 5a, Pall Mall East, on Friday evening, September 8th, at 7 o'clock.

The Exhibition will remain open until the 14th of November, from 9 a.m. till dusk, daily; also on the evenings of Mondays and Saturdays, from 7 till 10 o'clock. Admission, one shilling; evenings, sixpence. Or by tickets issued by the members. Catalogues, threepence each.

Pictures will be received on Friday, September 1st, Saturday, September 2nd, and Monday, September 4th, accompanied by a letter of advice, containing the title and description of each picture. All packages (carriage paid) and letters are to be addressed to Mr. Edwin Cocking, Assistant-Secretary, Photographic Society of Great Britain, 5a, Pall Mall East, London, S.W.

As no name or any information will be allowed to remain on the glass or frame, all labels, names, particulars of processes, &c., must be placed at the back of the picture. A correct and clear description of places, scenery, architecture, &c. (and especially the names of portraits) is requested for insertion in the catalogue, which is intended to be made as full and complete as possible. Coloured work (viz., painted photographs) will be excluded, but specimens of photography in colours, obtained by chemical means, will be accepted; also the prices of pictures for sale may be stated in the letter of advice.

A suggestion having been made, that an exchange of pictures, amongst members only, would be an acceptable feature in connection with the Exhibition, those members (exhibiting) who desire to take part in this matter, will please signify the same to the Assistant-Secretary, when arrangements will be made to carry the same into effect. —I remain, yours obediently,

R. J. Friswell, F.C.S., Hon. Sec.

Proceedings of Societies.

Amateur Photographic Association.

The adjourned meeting of this Society was held on July 25th, the Right Hon. the Lord de Ros in the chair. Mr. Glaisher, in laying before the Council his annual report, said that it was gratifying to find that the pictures for the present year were of a much higher average than last year, and called especial attention to a series of Indian pictures which were equal to anything ever contributed to the Society.

The following is an abstract of Mr. Glaisher's report:—

Class I contains 108 pictures, contributed as follows:—Dr. T. Cooke, M.A., 33; F. Beasley, Esq., 17; R. O. Milne, Esq., 8; W. S. Hobson, Esq., 6; F. G. Lloyd, Esq., 6; J. McAndrew, Esq., 5; W. Armstrong, Esq., 5; F. S. Schwabe, Esq., 4; T. Brownrigg, Esq., 4; R. Meade, Esq., 4; J. C. Stenning, Esq., 3; W. Vanner, Esq., 3; R. Murray, Esq., 3; J. H. Ritchie, Esq., 2; A. L. Steavenson, Esq., 2; Lord de Ros, 1; J. W. Richardson, Esq., 1; Rev. H. Palmer, M.A., 1; K. D. P. Roberts, Esq., 1; Captain D. McNeill, 1.

Class II. contains 103 pictures, as follows:—F. Beasley, Esq., 19; Dr. T. Cooke, M.A., 11; J. C. Stenning, Esq., 8; W. S. Hobson, Esq., 7; Rev. H. Palmer, M.A., 6; K. D. P. Roberts, Esq., 5; W. Vanner, Esq., 5; R. Meade, Esq., 4; Lord de Ros, 3; R. Murray, Esq., 3; Captain F. M. Allen, 3; F. G. Lloyd, Esq., 3; R. O. Milne, Esq., 3, A. L. Steavenson, Esq., 3; W. Armstrong, Esq., 3; W. G. Hunter, Esq., 2; F. S. Schwabe, Esq., 2; J. McAndrews, Esq., 2; Lieut.-Col. J. R. Turnbull, 2; W. H. Kirby, Esq., 2; Miss Louisa Coxe, 2, Captain D. McNeill, 2; the Hon. Noel Waldegrave, 1; Lieut. J. D. Lysaght, 1; W. W. Urrett, Esq., 1.

Class III contains 97 pictures, as follows:—J. C. Stenning, Esq., 11; W. G. Hunter, 9; J. McAndrew, Esq., 8; Lord de Ros, 7; Rev. H. Palmer, 6; W. Armstrong, Esq., 6; Capt. F. M. Allen, 5; F. Beasley, Esq., 4; E. Milsom, Esq., 4; K. D. P. Roberts, Esq., 4; Miss Louisa Coxe; G. W. Keeling, Esq., 3; R. O. Milne, Esq., 3; Lt. J. D. Lysaght, 3; W. S. Hobson, Esq., 2; R. Meade, Esq., 2; Dr. J. Cooke, M.A., 2; the Hon. Noel Waldegrave, 2; A. L. Steavenson, Esq., 2; Capt. D. McNeill, 2; Miss Fazakerley, 2; R. Murray, Esq., 1; J. H. Ritchie, Esq., 1; F. G. Lloyd, Esq., 1; W. H. Kirby, Esq., 1.

The following prizes were awarded:—Dr. J. Cooke, M.A., &c., Principal of the Civil Engineering College, Poona, first prize for Nos. 42 and 28, consisting of a large and elegantly chased silver goblet; R. Murray, Esq., for Nos. 104, 107, and 108, a silver goblet; F. Beasley, Esq., for Nos. 238 and 227, a large volume of photographs, by Mr. Stephen Thompson, entitled, "Chefs-d'œuvre of art and masterpieces of engraving;" R. O. Milne, Esq., a ditto, for Nos. 32 and 43; T. Brownrigg, Esq., for Nos. 26 and 27, an oil painting in frame; W. S. Hobson, Esq., for No. 128, a large album, elegantly bound in morocco; J. McAndrew, Esq., for Nos. 39 and 41, a silver goblet; Dr. J. Cooke, M.A., &c., for Nos. 14 and 31, a large album, elegantly bound in morocco; F. G. Lloyd, Esq., for No. 93, an oil painting in frame; F. S. Schwabe, Esq., for No. 25, an oil painting in frame; J. H. Ritchie, Esq., for No. 13, an oil painting in frame.

Certificates of honourable mention were awarded to W. Armstrong, Esq., R. Meade, Esq., Rev. H. Palmer, M.A., J. C. Stenning, Esq., K. D. P. Roberts, Esq., A. L. Steavenson, Esq., and W. Vanner, Esq.

The Earl of Rosse called the attention of the Council to the fact of the award of the prizes taking place so late this year, and proposed that in future no negatives shall be received after the 1st of May each year, with the exception of foreign ones, which may be sent in up to the 15th of the same month. This, after some discussion, was seconded by Mr. Glaisher, and resolved upon by the meeting.

A. J. Melhuish, Hon. Sec.

Edinburgh Photographic Society.

The annual holiday and excursion, which has now become an institution in Edinburgh, came off on Thursday, the 27th July, with, if possible, more than the usual *eclat*. The arrangements, as on former occasions, were undertaken by the "Out-door Committee" of the Edinburgh Photographic Society, the members of which deserve much credit for the zeal, energy, and good management which led to such a decided success.

The public, as well as the members of the profession, were well prepared for the holiday, both by advertisement and the exhibition of notices in the studios, intimating the intention to close, the result being, that business was altogether suspended in all the principal establishments of the city and suburbs, enabling both employers and employés to join the excursion. Notwithstanding the fact that the principals and staff of one of the largest firms in the city went off at an early hour on an excursion of their own, and the members of several others made private arrangements for the day, a party, little short of the usual members, assembled at the Waverley Station at 9.15, and proceeded by special train to Winton Castle, the seat of the Hon. Lady Ruthven, and one of the most beautiful and suitable places for a picnic in the country. Mr. Lessels, to whom they were indebted for the facilities given by Lady Ruthven, and who had gone on the previous evening, met the party on their arrival in the grounds, and in the name of her ladyship gave them a hearty welcome, and permission to ramble wherever inclination might lead.

The business of the day began with luncheon, in which Mr. Muir's annual gift of beer was an important element, and then three groups were taken by Mr. Annan on 16 by 12 plates, and one of a smaller size by Mr. Turnbull; after which, amusement became the order of the day, and with the younger members of the party at least, dancing on the bowling green, the principal amusement. Those fond of more active exercise adjourned to the meadow, below the castle and had a turn at football or Aunt Sally, and several other games came in for a fair share of patronage.

At one o'clock the gong sounded for dinner, which was admirably purveyed by Mr. Pillans, and heartily enjoyed by the whole party. When the more solid part of the entertainment had been discussed, the President of the Edinburgh Photographic Society, who was in the chair, said that although he did not intend to make a speech, as there was neither toast nor sentiment on the programme, he could not let the opportunity pass without congratulating all concerned on the very favourable state of the weather, on which the success of the trip so much depended. To Lady Ruthven they were deeply indebted for the unrestricted permission to roam at will through such magnificent grounds, and also for the liberal invitation to inspect the many curious and beautiful articles in the castle, and especially for the honour which she had conferred on them by her presence in the delightful ball-room so generously placed at their disposal. Thanks were also due to the committee who had made such excellent arrangements, but he would say nothing more on that head, as he knew that they had their reward in the great success to which those arrangements had led. And last, but not least, most hearty thanks were due to the purveyor, Mr. Pillans. It was no easy matter to cater successfully for a large party at a distance from home, and many a man with the best intentions failed from want of experience. Mr. Pillans had shown himself to be thoroughly up to his work, and he believed that he only stated the simple truth when he said that their commissariat department had never before been so well managed.

After dinner the dancing and games were resumed, and alternated by some excellent singing. There was, of course, the usual breaking up into twos and threes for the enjoyment of quiet strolls through the grounds, or quieter seats in cosey corners, while numbers visited the rural village of Pencaitland and its quaintly-beautiful old church.

Five o'clock, the appointed tea-time, seemed to some at least to come too soon; but the tea, nevertheless, was much enjoyed, and before leaving the table Mr. Davies asked the company to drink the Chairman's health, remarking that, as speeches were forbidden, he would only say that if they had never been better purveyed, they had never sat under a better chairman, or one who had done more to promote the harmony and success of the annual holiday.

After another hour spent on the bowling-green, the proceedings were brought to a close by the time-honoured singing of "Auld Lang Syne," and the party was formed into fours and marched past Lady Ruthven, who had again come out, and gave her three ringing cheers by way of good-bye. The station was reached at 7.15, and in a few minutes the train which had been in waiting started on the homeward journey, reaching Edinburgh at eight o'clock. The excursion passed off without a single hitch, and was in the highest degree a decided success.

Photographic Section of the American Institute.*

The usual meeting was held on June 6th, Mr. H. J. Newton

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* Condensed from the *Photographic Times*.

President, in the chair. The minutes of the last meeting were read and approved.

The **President** exhibited a number of prints from emulsion plates, and said that at a previous meeting he partially promised to show some further results in portraiture with emulsion. At that time his intention was to go to some of our well-known galleries, and make negatives with such skylights as are ordinarily used. His time, however, had been so much occupied with other matters that he was unable to do so. He was able, nevertheless, to show sufficient to convince them that his emulsion could be worked successfully in the gallery for portraits, producing finer results with more uniformity and certainty than by the old process. The development is more under control, and when one has had a little experience, and is probably fitted up for working emulsion, as many negatives can be produced in a given time as with the bath. He wished it understood that he presented these specimens more as a prophecy of the future of emulsion than as a perfected process. As he remarked on a former occasion, this process is in its infancy. There has never been a photographic process perfected by one person. One individual, in following out the experiments and suggestions of another, will think of methods of improvement in one direction, another will make some important change for the better in a different branch of the process, and so on, gradually improving until the utmost capacity of the process is developed. This is the way the nitrate bath system has been brought to its present state of perfection. The emulsion with which these negatives were made is as sensitive as the ordinary bath-plate, and, he claimed, would produce a better negative with the same exposure. He had good reasons for believing the sensitiveness can be still further increased by at least one-third, perhaps one-half. In the last year the keeping qualities of this emulsion had been thoroughly tested. He had here a negative and a print from it, both of which were made that morning. The emulsion with which this negative was made was compounded on the 1st of March, 1875; it is therefore fifteen months and six days old, and works as clear and brilliant as ever. He has discarded the use of a chloride to take up the excess of silver, and adopted hydrochloric acid. He had some prepared in this way about a month old, and it works as well now as when first made. He had prepared some four or five different lots in this way, and the results were very uniform. As hydrochloric acid is not of uniform strength, a good way to ascertain how much of a given sample would be required is to dissolve ten grains of silver in one-half ounce of water, and with a dropping-tube drop in the acid until the chloride of silver ceases to form. In this way we can learn how much of that particular acid is necessary to take up the excess of silver in a given quantity of emulsion. You can determine if any free silver remains by pouring a small quantity of emulsion on a plate of glass, and expose a few seconds to the light, and then pour on to it a small amount of the ordinary iron developer; if any free silver remains, the emulsion will turn black, and more acid should be added. If there should be considerable of acid it will do no harm, at least he had not discovered that it does, in his experiments with it. In developing a portrait negative, he first brought out the faint image with the plain pyro in water, from three to six grains to the ounce, then the alkali is added, and the details all brought out, but no attempt is made to obtain sufficient strength with this developer. When the details are well out he washes off, and flows the plate with an acid solution to neutralize the ammonia; citric or tartaric acid will answer. The development is then completed with pyro and tannin, and silver, as before given, or with iron. At another time he would give the formula for an iron developer. He had used iron for many years for developing dry plates, as is well known by those who read the photographic journals. Some six years ago the *Philadelphia Photographer* was illustrated with prints from his dry plates which were developed with iron, and the formula was given at that time. At the last meeting the question of tannin as a developer for dry plates was raised, which, to a certain extent, involved the question of priority in its use as a developer. He had never made any claim to originating the idea of its use. The first time he ever heard of it as such was many years ago. Being one day in the office of Mr. Charles Wager Hull, the veteran dry plate worker, and one of the most successful in the country, he showed him (the President) the first dry plate negative ever made in the United States. He stated to him that it was developed entirely with tannin, no other developer being used except tannin and silver. That was the first time he ever heard of its use for that purpose. It may have been used before that, but never to his knowledge. Mr. H. T. Anthony had used it in very small quantities in combination with iron in developing the ordinary bath negatives. Who first used it in combination with pyrogallic acid he was unable to say; but for many years he had used it, and those who read in the photographic journals his process for developing dry plates with iron will find that he used the pyro and tannin alternately with the iron to strengthen the negatives.

The **Secretary** said:—These pictures, gentlemen, take us, especially the older workers of a quarter of a century, entirely out of the field of light painting with which we were acquainted at first. We have even discarded the nitrate of silver bath. It does not appear at all in this process. But in this picture of the post office the President remarked that the fine quality of the work was due to emulsion, but I am convinced that there was some one behind the camera used who knew how to work it. This certainly is the most successful carbon picture that I have seen in this country, and I think this is the finest picture of its kind, all things considered, I have ever seen. In regard to the emulsion, I would say that I have seen it work within the last two weeks, and although I expected to be surprised, yet I did not think I would be so much surprised. And although the President says he considers it but a promise of what can be done, yet from its present appearance I would say that we were very near a very material change in our methods of working, not only out of doors, but indoors.

Mr. **John Gurney** exhibited several portrait prints from emulsion plates. The pictures were finished in glaze, and covered with oval glass. They were coloured by Mr. Gurney's process, and presented a very fine appearance. The price of these pictures, imperial card size, was stated to be fifteen dollars each.

Dr. **Adolphe Ott** showed a large number of prints made by Messrs Aubel and Kaiser, at Cologne. He said: Most of the photo-mechanical processes of the present day are based on the application of a mixture of gelatine and bichromate of potassa. Pure chromic acid, as well as its compounds, are not sensitive to the light; but in presence of an organic substance capable of parting with oxygen, such as paper, woody fibre, gelatine, &c., the light immediately acts thereon. Although this fact was discovered in the same year from which we date the for ever memorable disovery of Daguerre, it was not applied to any practical use until about twelve years later, when in the year 1852, Talbot, to whom we owe the first durable photographs on paper, worked out a problem that Wedgewood had vainly tried to solve, and on which is based the first heliographic (light engraving) process on the reaction of chromic salts on gelatine. Talbot covered a steel plate with bichromated gelatine, left it to dry in a dark room, placed it then under a positive, and submitted it to the sunlight. The opaque parts of the glass picture, preventing the light from acting upon the gelatine, left the same in its normal soluble condition, while all the transparent parts were rendered insoluble. The plate was then subjected to a bath of warm water, when all the parts unaffected by light are washed away, and the other parts remained. In this manner Talbot obtained a relief picture, which, on being treated with acid, produced an engraving on steel capable of giving a print upon removing the gelatine. In 1854 Paul Pretsch, an Austrian, invented his photo-galvanic process, by exposing the gelatine relief to the action of a galvanic current in a bath of sulphate of copper. This electrotype is taken in the same way as from a wood engraving, being elevated, when the original was the reverse. Pretsch employed a mixture of gelatine, bichromate of potassa, and iodide of silver, the latter being added to produce a grainy structure on the plate, and after being washed with water, it is finally treated with alcohol and an astringent liquid. This process was adopted and carried into practical use by the Photo-Galvanoplastic Company of London, from which I have seen exceedingly fine reproductions of the size of 18 by 25 inches. Why this company was not successful I do not know; probably it was because retouching was then not known, and also to the fact that chemicals and apparatus left much to be desired. Among the many investigators who have developed this photo-galvanic process, the names of Garnier, Placet, and Baldus in Paris, Avet in Italy, and Mariot in Vienna, may be mentioned; but I would say that it is by no means practicable for producing anything else but line engravings, such as maps, pen-and-ink drawings, &c., for which purpose, however, it is of great value. Instead of taking directly an electrotype from the gelatine relief, a coat in plaster of Paris, wax, gutta-percha, or even sulphur, can be taken, and from such matrices casts in type-metal can be produced. It is probable that the Photo-Engraving Company of this city uses this or a similar process. I have here a number of engravings of Messrs. Aubel and Kaiser, of Cologne, printed from plates of type-metal, which can be placed between ordinary types and multiplied by the printing press. Scamoni, in St. Petersburg, succeeded as early as 1861 in obtaining electrotypes directly from photographic negatives. The picture is intensified with pyrogallic acid, silver and mercury solutions, until a perfect relief is obtained. This is then covered with a varnish, and dusted with graphite, whereupon it is ready for the electroplater. Most of us, I suppose, have seen such helio-engravings of Scamoni. They were on exhibition at Paris in 1867, and some specimens of it are appended to Professor Vogel's popular "Treatise on the Chemical Effects of Light (Liepsic, 1876)." I have mentioned in a few words in what manner a photographic impression is obtained in gelatine. To describe all the particulars of the process would require a whole evening, and then no one who had not prepared a number of plates would be able to make immediate use of such a description, however detailed it might be. As all of us know, it was Albert, of Munich, who first succeeded in printing from a gelatine surface in the same manner as lithographs are printed. These Alberttypes, as they are called, give a picture with all the shadings, and, in fact, so high is the perfection this art has reached, that the work cannot often be distinguished from a photograph But while Albert has only succeeded in producing prints by the hand-press, Messrs. Brannerk and Maier, in Mainz (Germany), now have made the steam-press available to this process, enabling them to obtain from one thousand to fifteen hundred prints a day, and one uniform with the other. With the hand-press it is even difficult to get one hundred prints a day, and, moreover, the most experienced person is not able to produce always uniform prints. The firm just mentioned have recently completed a large work, consisting of several hundred pictures, representing the most interesting objects of the late Art Exhibition in Frankfort. They have also reproduced a series of cartoons of celebrated masters, representations of which are now placed within the reach of almost every one, the cost of printing being much lower than with the process employed by Albert. There can be no doubt that this latest improvement will be of immense value to both the arts and sciences, as now copies of any subject can be taken with an ease and perfection equal to ordinary photographs in every respect. Another advantage in this process consists in this, that the plates can be set up with type, thus enabling the publication of a photographic newspaper. The invention has thus far been secured by several large firms in Europe.

The Section then adjourned to the first Tuesday in September.

Talk in the Studio.

A Sitter's Criticism.—A correspondent sends us the following:—"I enclose you a verbatim copy of a letter I have lately received. The idea of turning a photographer into a nose improver and general eyebrow contractor is, I think, original. No wonder that in addition he should be expected to make his client blush:—'Dear Sir,—Please forward by return of post 2 more my charts as soon as possible. As regards the one you sent I like it well, but I think it's slightly defective in a few points, viz., the nose is too wide in middle, and left eyebrow is a little too large, and the general appearance of the face (except the forehead) is rather dark. I think if it had a little blush it would be better. Excuse me for thus criticising on your photography. As regards the money I will be going town very soon, and I shall be able to give it you. Hoping you'll remedy these defects,—I remain, sir, yours obliged ——.'"

Physical Science.—A very remarkable and interesting series of photograms, accompanied by suitable explanatory letterpress, has recently been issued for private circulation in the scientific world by the Rev. Percival J. Brine, one of the Senior Fellows of King's College, Cambridge, with a view to show that several of the doctrines of physical philosophy, hitherto recognized as cardinal and axiomatic, must be accepted with considerable reserve.—*Bell's Weekly Messenger.*

New Test for Nitric Acid in Water.—Nitric acid is one of the few acids all the neutral salts of which are soluble in water, rendering it impossible to precipitate it as we do sulphuric and other acids. A large number of tests have been proposed, and several are in use, a very delicate one being brucine, to which it imparts an intense red colour. Professor A. Vogel, of Munich, employs gold leaf, which dissolves in the aqua regia formed on adding hydrochloric acid. If 1·2 cubic inches of water be mixed with hydrochloric acid gold leaf, and evaporated, a large percentage of nitrates is indicated by the gold leaf growing smaller, and the solution turning yellow. If the quantity of nitrates is small, the gold is detected by chloride of tin; and even when very little gold has been dissolved, a light red precipitate will be noticed on standing. The advantage of this is that no sulphuric acid is employed, as this frequently contains nitric acid and other oxides of nitrogen which make the reaction doubtful.—*Scientific American.*

To Correspondents

Leathes.—The office of the Photographers' Benevolent Society is at 154, Fleet Street. Mr. W. T. Wilkinson, the Secretary, would doubtless afford you any information on the subject.

J. H. C.—We certainly think that the stains upon the print you send are due to some metal with which it has come into contact. The stain appears to be simply a mechanical one, and no chemical action has been set up. The stain is not due to zinc, or any compound of that metal; we should take it to be oxide of iron. There is hardly enough to test; but if you have the defect repeated, send us further examples, and we will examine them chemically. In the meantime see that the wet prints do not come into contact with any rusty iron.

Paris.—So far as our experience goes, operators earn less money in France than in England. They would be expected to work on Sundays till noon, even in the largest studios; certainly it would be the case in Paris. To be welcome, an operator should be proficient in retouching, for both in France and in Germany they work up their negatives more than we do. The *Moniteur de la Photographie*, published at the office, Quai Voltaire, Paris; the *Bulletin de la Societe Francaise de la Photographie*, at the office of the Society, Rue Louis le Grand. We continually give in these columns details of processes worked in France, which do not essentially differ from those practised in this country.

H. Colombier et Cie.—We think it probable that many photographers in England would avail themselves of an opportunity of getting their pictures finished and glazed, provided this could be done cheaply and expeditiously. You would probably have to submit specimens, however, to show the nature of the work performed.

Experimenter.—We do not know if you are a German scholar, but if so, the first portion of Dr. Eder's paper, printed both in the *Mittheilungen* and the *Correspondenz*, would give you every information about the double and single iodides. We only translated the second portion of Dr. Eder's excellent memoir, as it was the more practical, and we could not afford space for the whole. On page 267 you will find the author also makes reference in some measure to these double salts.

B. L. F.—Under-exposure is the chief fault of the print, or rather of the negative from which the print is obtained. If you have only a single lens, place the stop nearer to the lens, and give longer exposure. Do not fear losing detail in light carved work; but follow the golden rule of exposing for the shadows, and allow the lights to take care of themselves. Under-exposure will produce hard chalky lights and black shadows. Over-exposure tends to produce excess of detail in lights and shadows, with lack of contrast and consequent flatness. In an interior it is difficult to get over-exposure; but it is a better fault than under-exposure. 2. As a rule, a moderately strong developer is best for interiors.

Res Augusta Domi.—It is difficult to advise on commercial points in photography. A really capable man may, no doubt, enter on professional photography with reasonable certainty of success. He may find an "opening," or he may have to make one. But success depends chiefly upon the man. It must be remembered, however, that photography suffers, like all professions and businesses, with the present financial depression; hence this is not a favourable time for entering new enterprizes. Moreover, it is difficult to do much good in a quasi-professional position. To be successful you must enter into business in a business-like manner, and if you are afraid of losing caste or lowering your position you had better give up the idea. If you use photography as a means of making money, you must accept the position with "all its imperfections on its head." *Verb. sap.*

D.—Old collodion is an admirable detergent in cleaning; but it is very trying to the eyes, and sometimes really injurious.

Ferri-Sulph.—We have repeatedly given the proportions. About one part of protosulphate of iron in three of water will make a saturated solution. If it be kept well stoppered or corked, so as to preserve it from the air, it will keep well enough. A slight trace of brown colouration will indicate that some peroxidation has taken place; but a trace of this is unimportant.

Warsop.—Your communication will receive a reply shortly.

Anxious.—Next week.

C. P. R. Vernon.—In our next.

Several correspondents in our next.

The Photographic News, August 11, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Electric Light in General Use—Mr. Crookes' Radiation Experiments.

The Electric Light in General Use.—The electric light is gradually being adopted in a practical form for the lighting up of factories and warehouses. Hitherto, as is well known, the electric light has been little else than a wonder and an experiment, and the occasions on which it has been practically employed are very rare indeed. At the present moment France appears to be in the van, and we hear of several establishments where arrangements have been made for lighting up with electricity. Last year there were but two examples of this method of illumination to be seen—viz., at the foundry of M. Ducommun at Mühlhouse, and at M. Gramme's factory in Paris. Now the light is daily—or we should say, rather, nightly—employed by Pouyer-Quertier in the Ile Dieu, by Bréguet in Paris, by Sautter, Lemounier, and Co., also in Paris, at the sugar factory in Sarmaize, and in the iron-works at Bessege. Six other firms and establishments in Paris and Lyons are having the apparatus fitted, while the Vienna Opera House employs the electric light, it is said, every evening. The electric current is generated from a magneto-electric machine made upon Gramme's principle, and besides those in France there are now seven such instruments in Russia, six in Spain, five in Austria, four in Italy, six in England, three in Portugal, and four in South America. It will be remembered that we have sent two of these electric light machines with the North Pole Expedition, both the *Alert* and *Discovery* being provided with such means of illumination; and our iron-clad navy, it is said, is to be provided with similar lamps, to prevent attack from small torpedo vessels under cover of the darkness. It is very satisfactory to know that we have been able at last to apply such a valuable means of illumination for the purposes of every-day life, a problem which has required more than half a century to solve. It was, if we remember rightly, in 1804 that Sir Humphry Davy first showed the electric light publicly in this country, and yet it is not until the present year that we have begun to adopt the light in factories and workshops. The great advantage of the electric light seems to be that, when once established, the source of light requires little care or solicitude, while its cost is certainly not so great as that of a multitude of gas lamps. Again, there are no unhealthy vapours given off, while the light is so brilliant that you may perform at night the same operations pretty well as in the daytime. Another point of considerable importance is that colours appear the same by electric light as they do by sunlight. Finally, there is no such risk of fire as with gas and candles in large numbers, and the walls and ceilings do not suffer from products of combustion. A hard sort of graphite which is obtained from gas retorts is the material from which the points are manufactured, and so simple is the apparatus that after two or three days' experience any man can take charge of it. It is said that during the past three months as many as thirty machines have been in action, and not a single one has required repair.

Mr. Crookes' Radiation Experiments.—The recent experiments of Mr. William Crookes, F.R.S., upon repulsion resulting from radiation, will still be fresh in the memory of our readers; and that gentleman's radiometer has already formed the subject of experiment with many photographers. This radiometer, our readers will remember, is a windlass or wheel, turning on a pivot in a glass case, tiny pith balls at the extremity of the spokes being black upon one face and white on the other. Inside the glass case there exists a vacuum, as nearly as possible, and upon approaching a candle flame or other source of light to the radiometer the wheel swings round with a greater or less degree of velocity. According to the intensity of the light, so the energy of the little instrument responds, and the radiometer was consequently regarded as one of the most accurate of light measurers. Mr. Crookes has since continued to work arduously to discover the true cause of this movement of the radiometer, for he does not seem to have been satisfied with the obvious explanation that it was due to the action of light alone, and he has now published a further communication which solves the problem to a considerable degree. Mr. Crookes tells us that he has derived considerable assistance in his recent investigations from Professor Stokes, F.R.S., who, as most are aware, like Mr. Crookes, was actively connected with the Photographic Society of London in its early days. Working harmoniously together, these gentlemen seem to have brought their labours to a very satisfactory conclusion, and their verdict is, that the force which puts the little radiometer into motion is due to radiation *indirectly*, but not *directly* so. The small residue of atmospheric air which still exists inside the case of the radiometer is the means of setting the instrument in motion, the arms being acted upon by air-currents produced by heat, and thus made to revolve. Indeed, Mr. Crookes, in a short paper which he has communicated to the Royal Society on the subject, thus sums up the matter very tersely. He says:—"The evidence afforded by the experiments of which this is a brief abstract is to my mind so strong as almost to amount to a conviction that the repulsion resulting from radiation is due to an action of thermometric heat between the surface of the moving body and the case of the instrument, through the intervention of the residual gas. This explanation of its action is in accordance with recent speculations as to the ultimate constitution of matter, and the dynamical theory of gases." Thus Mr. Crookes plainly states that instead of being due to light, the movement of the radiometer is brought about solely by heat rays.

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OBSERVATIONS IN THE TYROL.*

BY H. BADEN PRITCHARD,

Author of "Beauty Spots of the Continent," &c.

I don't know if the custom is to be found elsewhere in Europe nowadays that still prevails throughout North Italy and South Tyrol—viz., the hanging up of a bunch of twigs, or the branch of a tree, over the door of any cottage where wine is sold. Public-houses may be a little rare at times, but you cannot pass through a village in these parts without seeing half-a-dozen houses with the sign over their doors. The old proverb that "good wine needs no bush" is no doubt very true, but I have personal experience that a good glass of red Tyrol wine may ofttimes be secured where the bush does adorn the doorway. It is the high passes over the Alps, I suppose, that stand in the way of the exportation of this generous wine, which would fetch a good price in England, if it were only to be had. Here a litre of sound wine, far better than the usual *vin ordinaire*, can be purchased for fivepence or sixpence, and it would be readily sold for four or five times this money in London.

Bread and wine are probably the principal articles of diet hereabouts. I am glad to say, however, that I have seen no cases of drunkenness or excess among the peasantry, who, if somewhat priest-ridden, are without doubt a straightforward and devout class. There is no country I know of which is more thickly strewn with emblems of religion. Scarcely a village picture can be taken without including some tiny chapel, or crucifix, or figure of a saint in the photograph. I have secured pictures of houses whose fronts present one mass of fresco paintings and mottoes, all of a religious nature. Again, on the wayside and in the fields there are huge crucifixes to be met with, with the image of our Saviour the size of life; not one or two, but during a day's march a couple of score of such emblems may be passed. The figures are, unfortunately, so badly modelled that they only serve to call up feelings of horror on the part of the traveller; and when, as is sometimes the case, they are supplemented by ghastly pictures of beings in purgatory, one gets quite appalled at the terrible exhibition.

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* Continued from page 362.

Many of the mottoes are of a very quaint nature. Some are mere proverbs; while others are invocations to God and to the saints. There is one more frequently employed than others, from the circumstance, no doubt, that it is supposed to protect the house upon which it is painted from fire. It is addressed to Saint Florian, who is believed to have the element of fire especially under his control; it is rather a selfish motto, to say the least of it:

> "O, holiest Saint Florian,
> Spare thou my house;
> Let others burn."

Whenever a fatal accident occurs, either from somebody falling from a precipice, or being carried away with an avalanche, or drowned, there, on the spot where the casualty took place, a little picture is set up, painted by the village artist, setting forth how the accident happened. These little pictures form quite a feature of the country. Unfortunately, accidents of the sort are rife in winter time, and as the pictures remain intact for forty or fifty years, they soon grow up apace. In dangerous places, at the foot of a bridge where the torrent is unusually treacherous, or at some narrow ledge of a pass, you may see sometimes four or five little pictures standing up side by side. The artist has shown the poor victims struggling in the torrent, or falling headlong into space, and beside their heads is usually painted a little black cross, to signify that they will inevitably be killed in the end. Near at hand may be seen a few eye-witnesses, dressed in their best clothes and looking on complacently, as if they thought human aid not only useless, but quite uncalled for.

I have rested here at the village of Brenner on my way back to Munich, instead of passing a night at Innsbruck. As everybody knows, the railway now goes over the Brenner Pass, and you may therefore scale the lofty heights comfortably seated in a railway carriage. My reason for not going on to Innsbruck and resting the night there was twofold. By remaining at the old posting-house at the top of the pass, whence I am writing these lines, I am enabled to have one more day and a cool night among the mountains, to brace myself up for my thousand-mile journey across the hot Continent, and I also keep clear of the big and expensive hotels at Innsbruck. That town is the only place in the whole of the Tyrol that resembles Switzerland in the matter of high prices and extortion, and as I have been so thoroughly pleased with my little tour, I do not want it marred just at the last moment by a *contretemps* of any kind. The big hotels of Innsbruck are notorious, and the only explanation I once received from the landlord in reply to a protest was, that well-worn excuse that the season was always a very short one. I daresay my readers have many instances fresh in their memory when a similar reason has been given them for swindling, for it is one that is very often adduced. I always think the best plan under the circumstances is to go somewhere else next time, and not to bother yourself about long and short seasons; as far as my friends and myself are concerned, we shall not trouble the Innsbruck innkeepers this year, and they must therefore console—I was going to say, revenge—themselves for a short season with or upon someone else.

The village of Brenner consists simply of a church, the post-house, and half a dozen cottages. The inn, with its long corridor and rows of empty bedrooms, could accommodate fifty or sixty travellers, I have no doubt; but at the present moment we are its sole occupants. One's footsteps resound through the empty passages and up the big wooden staircase, and when you ring the bell you can hear the waitress approaching your door at the moment she begins her long journey from the basement. In the evening a few railway officials make their appearance, and join in the conversation round the table; but whatever life the little place enjoyed in years gone by from travellers across the pass in the old diligence days has quite departed. The Brenner, by reason of its low elevation, was always a favourite road from North into South Europe, and consequently at times the post-house must have been full to overflowing with travellers going north and south. To-day the Indian mail and the whole of our Eastern traffic by way of Brindisi traverses the Brenner line.

I have only had one mishap with my roller dark slide during the whole time of my trip, and for one reason I am glad it occurred, for I was enabled to judge of the intricacy of the mechanism inside. The roll of tissue was a little too broad for the box, and consequently the edge hampered the band and prevented it from rolling freely. The consequence was, that in giving a powerful twist one day to one of the rollers I tore the band in two. The matter was, however, easily rectified at night; I removed all the tissue that had been exposed, and then by means of sticking plaster cemented the band together again. In a quarter of an hour the dark slide was ready for work again.

I have now packed up carefully for my return journey, to prevent the fine dust with which you are so much troubled on a long railway journey from penetrating the apparatus. I shall be happy indeed if I can prevent the Custom-house officers from peeping into my photographic packages on my way home, for I am liable to four such visitations before I can deem myself perfectly safe.

Brenner Village, July 23.

NOTES ON PHOTOGRAPHY, HISTORIC AND DESCRIPTIVE.

BY CAPT. ABNEY R.E., F.R.S.*

We now come to a large class of printing processes known as photo-mechanical. And here I should state that the term photo-mechanical is applied to such processes as are independent of light for production of prints, after that agency has once furnished a plate or means of producing a plate. The first of these that I shall attempt to describe is that known as the Woodburytype, after the inventor, Mr. Walter Woodbury. The following outline will give some idea of the methods resorted to:—

A skin of gelatine is prepared somewhat in a similar manner to that which I shall describe in the heliotype process, only for this it receives a tough film of collodion on one surface. This surface is placed next a negative on glass, and the light from an unclouded sun, or from a luminous point (such as the electric light) is allowed to fall on it. Owing to the thickness of the gelatine employed, this method of exposure is necessary in order to secure sharpness. The print is developed as in the autotype process, and we get an image in great relief, formed by the insoluble gelatine, resting on the tough collodion film. When dried, this relief picture is placed on the surface of a flat, soft metal plate, and, by hydraulic pressure, is forced into it, furnishing a mould, perfect in all its parts. The wonder is at first excited that the gelatine does not break under the enormous weight brought to bear upon it, but when it is recollected that ferns and grasses can be made to furnish similar impressions, the astonishment is diminished, in that the substance employed is now in a leathery condition.

Apparently it matters little as to which side of the relief is pressed into the plate. In one case we should have to use a reversed negative, whilst, in the other, any ordinary negative may be employed. This is important to the photographer, as may be surmised.

Before us we have the negative, a relief from it, and a mould taken from the relief. This mould is now placed in this press, which consists of a flat plate (which can give slightly in any direction, and is capable of being raised or lowered), and a flat hinged top, to which is affixed a perfect plane of glass. When this lid is brought down on to the mould, the lower lid gives till perfect contact is got between the two surfaces; a species of clamp enables the lid to be kept in position. You see on placing this piece of paper in the mould, the clamp closes with difficulty, but a little mechanical contrivance attached to it causes a great pressure to be brought to bear. Opening the press once more, a little warm gelatine, which has been impregnated with colour, is poured on the mould, and a piece of resinised paper placed over it; the press is again closed. The mass of cold metal soon cools the gelatine, and on opening the lid, it is found that the excess of gelatine has been squeezed out beyond the mould, and on lifting off the paper, a picture is found adhering to it. This image is really formed in precisely the same way that a cook forms her jelly in a mould, though the colouring matter in this case is somewhat different. When dry, the picture is rendered insoluble in water by passing it through an alum bath. At first sight, this process might seem to be slow, but when it is remembered that half-a-dozen moulds can be made from the same relief, it requires no great exercise of the imagination to surmise that the pictures may be produced almost as rapidly as a lithograph. I referred to the relief necessary to produce the mould. From what I have described it will be seen that the dried relief must be as great as the wet print of the autotype process in order to produce the same gradations.

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* *Nature*. Continued from page 365.

The last process I shall describe is known as the heliotype process, and I have chosen it for demonstration as I am practically acquainted with its working at Chatham, and not from any inherent superiority it may possess. It is a type of all the photo-mechanical processes, if we except Woodburytype, and it is to such as these that we must look for our book illustrations, though I am still in hopes that we may have a really good process for surface printing from a metal block, capable of being set up with type. We have a promising example of this latter process in what is known as Dallastint, the offspring of Mr. Duncan Dallas; but as it is a secret process I cannot say anything regarding its production.

In the heliotype process there are various operations.

To begin with, there is the preparation of the gelatine film on which the image is printed.

The manner of preparing it is as follows:—Gelatine is dissolved in water by aid of heat, and to it is added a sensitizer which consists of potassium dichromate, to which a small quantity of chrome alum is added. Now here I must remark that this chrome alum forms an important part of the process. Gelatine we know ordinarily dissolves in hot water, but if it be impregnated with chrome alum, not only does it render the gelatine insoluble, but it also toughens it in a marked manner when it is wetted. When the subsequent operations are explained, the importance of this property bestowed on the gelatine will be manifest. The solution of gelatine (with this sensitizer mixed in it) is flowed over a carefully levelled glass plate to such a depth that in drying it has the thickness of a piece of Bristol board. The glass plate may be ground and very slightly waxed; or it may be coated with a dilute solution of india-rubber to facilitate the gelatine leaving it, when it is required to be employed for printing purposes. A negative (which must be wha is known as a reversed negative) is placed in a pressure frame, the gelatine is stripped off the plate, and the surface which was next the glass is in contact with the taken image. The necessary exposure may be estimated by an actinometer or by examining the image in the printing-frame. When judged to be sufficiently printed, the back of the print is hardened by exposure to light. This operation gives toughness to the gelatine, and renders it capable of resisting the treatment it has subsequently to undergo.

The skin of gelatine is next taken, and immersed for a few seconds in cool water (in practice a temperature of over 60° F. is found to be the best). A pewter or other metal plate, coated with india-rubber, is now placed underneath it, and the film caused to adhere to it by the use of the squeegee. The pressure of the atmosphere causes the adhesion as it does in the autotype process. For convenience' sake the edges are now run round with a solution of india-rubber in benzole, and paper pasted round them, to prevent the water getting beneath the skin. The plate is then immersed in cold water for about half-an-hour, to soak out the unaltered dichromate, and it is ready for use as a printing surface after the superfluous water is blotted off.

The gelatine skin is all in an insoluble state owing to the presence of the chrome alum; but further, the part where the light has acted fully will not absorb water, whilst that which only partially absorbs water has only been partially acted on by light, and the part wholly unacted upon absorbs it greedily. When a roller containing greasy ink is passed over it, those parts which contain a great deal of water take no ink, particularly if it be stiff ink. The parts containing a little water take the ink lightly, whilst those parts which have refused to imbibe any moisture take it greedily. Evidently here we have a means of obtaining a picture of half-tone subjects in printers' ink. Another point is that thin ink takes better in a partially exposed portion than does a thick ink, hence to bring out the half tone it is customary to use two or even three inks of different consistency. The printing plate is generally placed in the bed of an ordinary printing-press, and rolled up with a soft roller or rollers, charged with the printing inks. The impressions are pulled off as for letter-press, though more force is necessary. In order to have clean margins a mask is cut of the proper dimensions, and brought to certain register marks. The paper usually employed for receiving the impressions is enamelled, the enamel being formed of barium sulphate and gelatine. Any ordinary paper, however, may be used, if it have the power of taking up the ink. On the walls of the exhibition are some photographs printed on ordinary drawing paper, and they are effective in their way.

Mr. Edwards, the patentee of this process, proposed to use a series of gelatine printing surfaces from the same negative, to form a series of photo-chromotype, and I have seen some specimens which are very successful. Little seems to have been done, however, in this direction at present. When drawing your attention to the manufacture of the gelatine skins there was one point to which I did not allude. You may make your skin of jelly or of blanc mange. I have found that a certain proportion of milk added to the gelatine in lieu of the water gives more delicate pictures than does gelatine alone. There are severa kindred processes worked at present, amongst which I must notice that of the Autotype Company. In their process an exceedingly thin layer of gelatine is formed on the plate and hardened by means of gum resins. The gelatine is not removed from the plate, but it is printed from whilst still on it. The film is hardened from the back. The glass plate can be inked in as described for the heliotype process, and can be pulled in a lithographic press or in an ordinary printing-press. M. Thiel, of whose process we have beautiful examples on the walls of this room, uses an ordinary lithographic printing-press.

I have only been enabled to give you a brief outline of these few processes, specimens of all of which are to be found in this exhibition. Short as have been the descriptions, I hope, however, that they have been sufficient to enable you to see the immense strides in the methods of producing prints that have been made in the last dozen years. When we consider that the autotype, the Woodburytype, and all the other mechanical printing processes, have been worked out in that time, you will see that the inventive faculties of those who labour in the art science have not been allowed to lie dormant. Perhaps in no other occupation is there such a field for discovery and improvement as in photography; and considering the many workers, in it, and the large industry it represents, we may surely hope that in 1886 we may again be able to record a still further advance; it may be, perhaps, in the line I have already indicated, and in colour pictures.

PHOTOGRAPHY IN CONNECTION WITH THE OBSERVATION OF THE TRANSIT OF VENUS AT ROORKEE.

BY CAPT. J. WATERHOUSE, ASSISTANT SURVEYOR-GENERAL OF INDIA.[*]

Jansenn Slide. — A repeating arrangement for taking several pictures on one plate, designed by Dr. Warren de la Rue on the principle proposed by the eminent French astronomer, M. Janssen, and known as the Janssen slide, also formed part of the equipment. This arrangement having been fully described and figured by Dr. De la Rue,[†] it will suffice to say that it consists of a circular wooden case about twelve inches in diameter and two inches deep, with a removable shutter in front, and constructed so as to be fitted on to the camera in the position occupied by an ordinary dark slide. Revolving on a central axis within this case is a metal disc or plate-holder, with sixty radial slots and as many circular spaces racked in its edge, carrying the sensitive plate held between rings strongly electro-plated with silver. Outside the case, in front, a second smaller disc revolves just outside the shutter, and is provided with a radial opening capable of being opened or closed at pleasure, so as to regulate the exposure by admitting more or less light to the plate through a radial slit cut in the shutter of the slide, about one inch long and exactly corresponding in position and width to the sixtieth part of the circumference of the plate. The axis of this exposing disc passes through the case and carries a pin which fits into the slots in the edge of the revolving plate-holder, and is turned, from outside the case, by means of a winch arranged with gearing, so that it may be worked either by hand or automatically by means of clockwork. This axis also carries an ivory ring on the periphery of which is fixed a piece of platinum wire which, as the axis revolves, comes into contact with a strip of platinum fixed on a spring attached to a connector, so that it may be placed in electrical communication with a chronograph and electric clock, and thus enable the precise moment to be recorded, when the uncovering of the aperture in the shutter of the slide by the exposing disc exposes a portion of the plate to the sun. As there are sixty slots, and the aperture corresponds to the sixtieth part of the circumference of the plate, it is evident that for each entire revolution of the plate-holder sixty distinct images will be impressed on as many separate portions of the plate within an annular space about one inch wide round its circumference.

The apparatus is constructed so that the plane of the sensitive collodion film shall exactly coincide with that of the focussing screen of the camera, and in order to adjust the instrument so as to obtain an image of any desired portion of the solar limb or disc, it is arranged that when the sensitive plate is in the proper position for receiving the first image of the sixty, the observer can look from behind, through a series of three red glasses, one of which is in front of the plate, on the exposing disc, and the other two behind it, one on the revolving plate-holder and the other on the wooden case. The three glasses are coincident only in one position, *i.e.*, when the stop, formed by racking the last of the radial slots for only a short distance, is on the right of the axis; and as the stop is on the left of the axis after a complete revolution, the revolving plate-holder must always be reversed through an entire revolution after each operation in order to bring it into the proper position for focussing. While focussing, the sensitive plate itself acts as a focussing screen.

By means of clockwork the rate of revolution of the plate-holder could be so adjusted that the exposures might be made at intervals varying from about half a second to two seconds, but as it was desirable not to expose the separate pictures too rapidly, the rate was set so that the entire revolution might be accomplished in about a minute and a half.

Preliminary Trials with Dry Plates.—I received intimation about the middle of August, 1874, that, with the concurrence of the Surveyor-General, my services were likely to be placed at Colonel Tennant's disposal for the superintendence of the photographic observations. As there appeared to be a general opinion in Europe that a dry process would be most suitable for continuous observations lasting over a period of some hours, and would have other special advantages for the purpose, the first thing to be done was to select the process to be used, and to gain some experience in working it; and although the weather at that time of the year was most unfavourable to photography, and very trying to work in, all the time that could be spared from my regular office duties was devoted to preliminary trials of dry plates in Calcutta till October, when I joined Colonel Tennant at Roorkee.

It was understood that the English observers were to use the beer-albumen dry process recommended by Capt. Abney, R.E., and therefore my first trials were with it; but although the instructions given by Captain Abney were carefully carried out, it was found impossible to obtain the exalted sensitiveness claimed for the plates, and, though the pictures obtained had many good qualities, the exposures were so long that I could not but consider the process unsuitable, and look for some other by which more sensitive plates could be secured. The beer-albumen process was, however, tried on several different occasions, both in Calcutta and at Roorkee, with different collodions and various samples of beer, but always with the same result.

The cause of the great want of sensitiveness shown by these plates could not be discovered. Captain Abney says that those who have not succeeded with his process have not used a sufficiently porous collodion; but on this occasion several collodions were used, some containing a large proportion of water, but without any noticeable advantage; though other dry plates, taken with the same collodions, gave much greater sensitiveness.[*]

It is possible that the beer used was not quite suitable from containing too large a quantity of chlorides or other substances detrimental to sensitiveness, and that this was probably the case is shown by the fact that a much greater sensitiveness and generally better results were obtained with the mode of working the beer-albumen process recommended by Mr. Davies of Edinburgh, in which a small quantity of nitrate of silver is added to the beer, with the effect of throwing down all the chlorides and much of a glutinous substance; but even this modification did not give quite satisfactory results, and the idea of using the beer-albumen process for the Transit plates was given up. Although the process has, no doubt, yielded excellent results in the skilled hands of Captain Abney and others, the uncertain composition of the different liquids known as beer render it undesirable that this substance should be used in the preparation of dry plates which are to serve as a standard for scientific purposes, and from which comparable results are expected. For such purposes more certainty and uniformity will be attained by the use of materials which are likely to be of nearly the same chemical composition in all parts of the world.

As the beer-albumen process was not found to answer, attention was turned to other dry processes, and several different methods were tried with varying results.

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[*] Continued from page 363.

[†] Roy. Ast. Soc. Monthly Notices, May, 1874.

[*] I have quite recently tried the beer-albumen process again with samples of collodion yielding good results with other dry processes, but found the plates just as insensitive as they were before. By flowing the films, after washing away the free silver, with a ten-grain solution of pyrogallic acid in beer, then again well washing, and finally flowing the plate with a mixture of glycerine and dilute albumen, plates were obtained giving excellent results with at least ten times more sensitiveness than those prepared by Captain Abney's plan.

At an early stage of the experiments it was found from trials with a rough photo-heliograph, constructed in Calcutta for the purpose, that a process which might give very good results for taking views, &c., would not answer for the sun, and *vice versa*, and the same was afterwards found to be the case when working with the English photoheliograph.

Among the most promising dry processes tried in these preliminary experiments were the gum-gallic, in which the so-called preservative is composed of a solution of gum-arabic and gallic acid, and a process in which a preservative was laudanum, either alone, as a dilute solution in water containing from 16 to 4 per cent. of laudanum, or mixed with gum arabic or gum tragacanth, in order to keep the pictures free from the stains liable to occur when using the laudanum alone. Excellent results for views were also obtained with a filtered mixture of laudanum and very thin arrowroot water. I was induced to use the laudanum from a statement of Professor Vogel of Berlin, that plates prepared with morphia were more sensitive to the comparatively non-actinic rays from the outer parts of the solar disc; and though I did not remark any special superiority in this respect, the laudanum plates were found more sensitive than most of the others tried. Plates prepared with a saturated solution of morphia in water also gave good results.

The addition of nitrate of uranium to the nitrate of silver bath used for sensitizing the plates, as recommended by Captain Abney, was found advantageous for most of the dry places, giving increased sensitiveness and other good qualities. As some doubt has lately been thrown on the advantage of the uranium bath, it may be as well to state that in the ordinary wet process with bromo-iodised collodion I have found that no advantage is gained by the addition of the uranium salt to the nitrate bath, but, on the contrary, there is a great loss of sensitiveness. With dry plates, however, it is different: the gain in sensitiveness is well-marked, and the shadows appear cleaner than on plates sensitized in the ordinary bath without the uranium.

(*To be continued.*)

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MICRO-PHOTOGRAPHIC RESEARCHES UPON THE TRANSFORMATION OF COLLODION IN PHOTOGRAPHIC OPERATIONS.

BY M. J. GIRARD.*

A MICROSCOPIC examination of collodion permits one to recognize the nature of the texture of a film of collodion, and to follow the reactions which take place in the production of the photographic image. When collodion is of good quality, the plate appears translucid and colourless, the pyroxiline being completely dissolved, but its composition and age, as also the reactions inherent to the sensitizing process, change its texture.

The micro-photographs which I have submitted to the French Photographic Society have been magnified fifty diamètres, and show some of the most frequent modifications that take place. Old collodion, which gives fine images, but the rapidity of which leaves much to be desired, contains bubbles of liquid ether. If it is too alcoholic, it assumes the aspect of a cellular tissue, and if it contains much water the cotton fibres become apparent in the form of flocculent matter. Collodion which is too thick and intense, and is not endowed with rapidity, has the appearance of an undulating cellulo-vascular tissue; this defect in the regularity and evenness of the film detracts from the sharpness that the image should possess.

Two other specimens which I produce show the film at the moment when the process of sensitizing in the nitrate bath is as yet incomplete, and also when the process has completely terminated. In the first example, the oily patches which are the indication of an incomplete reaction are full of striæ and groups of crystals, some in the form of needles, others amorphous. Certain portions of the film show very fine details. It would seem as if the crystals of iodide of silver in course of formation had been arrested in their development. In the second print the process of sensitizing is complete, the texture of the sensitive film is homogeneous and compact. It is covered with an uniform network, rendered the more evident by some portions of the plate being exempt from crystallization.

The greater part of the photographic reactions necessary to obtain an image are brought about by the successive transformation of the crystallographic system; the reaction of the iodide of silver is the most perceptible. It is evident, therefore, that an examination of the collodion film under a microscope of medium power permits the operator to discover any defects in the working of a process.

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Recent Patents.

PRINTING FRAMES FOR PHOTOGRAPHS.

BY J. L. SABUNJIE.

THIS invention received provisional protection only.

My invention relates more particularly to the apparatus adapted to be employed in the copying of photographs by the obtainment with simple means of paper negatives of the photographs to be copied. In such apparatus the printing has been effected by the aid of a sheet of glass and a card, held together by means of an elastic band.

The object of my invention is to produce an efficient printing frame of a simple and cheap character. My said frame consists of a metal frame fitted with glass, and provided with metal bars or clasps, which are hinged by one end to the frame, and are formed at the other end to clip the edge of the frame tightly. When in use, the photograph to be copied is laid on the glass, and is covered with a piece of prepared paper, and then with a number of pieces of thick paper; the clasps are then shut down, and the frame is exposed to the light. This printing frame may also be employed when printing from glass negatives.

In a more simple form of the printing apparatus metal clasps are made to clip the glass without the aid of a metal frame.

PHOTOGRAPHERS' HEAD RESTS.

BY CHARLES JOHNSON.

THIS invention received provisional protection only.

My invention of an improvement in photographers' head rests and in other kinds of stands, such as book and music stands or desks, relates to improved means of enabling the rest or stand to be adjusted in any desired position and at any desired height. In such rests the upright rod on which the rest or stand is carried has generally been fitted to slide in a corresponding socket, provided with a set screw to enable it to be fixed at any required height, a separate joint being provided to admit of the rest or stand being adjusted at the required inclination.

Now my invention consists in providing for this vertical and lateral adjustment by one and the same means, and to this end I employ a ball-and-socket joint of the following construction:—The ball through which the upright rod passes is made in two halves, clamping the upright rod between them so as to grip the rod tightly when the socket in which the ball works is tightened up. This socket is also made in two parts hinged together and provided with a thumbscrew, by which the socket may be tightened up or loosened as required. By loosening this thumbscrew the upright rod may be slid through the ball, and at the same time inclined by the ball working in its socket, whereby the rest is adjusted, both as regards height and position, at one and the same action, the whole being firmly secured by tightening the screw.

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* *Bulletin de la Societe Francaise.*

The Photographic News.

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THE POSSIBILITY OF PHOTOGRAPHING SOUNDS.

It has been possible to photograph so many phenomena, and to adapt the camera to so many scientific purposes, that it really becomes a difficult question to say where we shall stop. For barometric and thermometric readings, the sensitive plate has already been made to act as recorder; and in medicine, astronomy, navigation, and other sciences, the camera, as we know, has given us the most wonderful results. The latest speculation that has arisen in the scientific world anent photographic action is the question whether it will ever be possible to photograph tones and sounds as they are uttered. As we can photograph light waves, it would seem but a step further to secure a record of the waves of sound; and if a series of instantaneous views during the course of a speech, or the performance of a piece of music, could be taken—the record being secured upon an endless sensitive band, for instance—the curves or markings formed by such sounds might afterwards be capable of being read and rendered again. If this could be done, we say, we should at once render shorthand writing unnecessary, and clever stenographers would be of much less importance than they are now. Dr. Vogel, of Berlin, is of opinion that this idea of photographing one's speech is by no means so far-fetched as it may seem to be; and certainly, when we call to mind what has already been done in the way of registering sounds, we are disposed to agree with him.

All have heard of the sensitive flames which formed the subject of several demonstrations at the Royal Institution in Albemarle Street, a little while ago. A gas flame of a certain nature is considerably influenced by vibrations of sound; different notes sounded in its neighbourhood alter its shape and make it rise and fall perceptibly. To Mr. Barrett, we believe, is due the honour of having been the first to observe the phenomenon, and Dr. Tyndall subsequently lectured on the subject several times. The latter was at some pains to show his audience the degree of delicacy possessed by flames, and a brilliant display of experiments which he organized was thoroughly successful in doing this. In one experiment, if we remember rightly, the learned doctor recited a piece of poetry before a flame which actually went out when a certain word or sound was pronounced, and he distinctly proved that a most marked change overcame the flame as different sounds or vibrations were uttered.

The possibility of securing records of sound by means of photography rests upon this sensibility of flames to sound vibrations. M. König, of Paris, has lately constructed an instrument of a most simple character which renders visible the vibrations of any sounds uttered in its presence. The instrument consists simply of a burning gas-jet, the tube of which has at one spot an orifice covered with an elastic membrane. This membrane or drum is the means of influencing the flame. A person speaking or singing against the drum at once works upon the flame in a most extraordinary manner; as the sounds are uttered one after another, the flame takes up different forms, and these forms reflected in a revolving mirror give rise to a continuous light curve, which is governed by the sounds that are pronounced. So that a speech or song would be represented by a series of visible curves.

M. König has already sketched some of these curves as he has seen them, and it will therefore be but going a step further to photograph them. To do this, Professor Vogel points out, it would simply be necessary to provide the revolving mirror with clockwork, so that it might move at a given rate, and to employ a gas flame which is sufficiently actinic to produce an instantaneous impression upon the sensitive plate. For instance, cyanogen, although it has never yet been used in photography for such purposes, Dr. Vogel thinks might be employed with advantage, as it would probably give a very vigorous image; but this would, of course, be a matter of experiment.

That some practical results may be secured, therefore, in the matter of recording sounds by photography, there seems a great degree of probability, and if the flames can only be made to alter their shape sufficiently, records even of a delicate nature might perhaps be secured. We do not suppose, however, that the time will ever come when the staff of reporters at the House of Commons will be replaced by a sensitive flame and a camera. A monotonous curve would in that case represent brilliant and prosy speakers alike, and the innovation would at once get over that much-vexed question of "strangers" which is so often cropping up. Our legislators might hold their debates in private, without being influenced by the knowledge that every word they uttered is watched and weighed by galleries of spectators. The little gas tell-tale would be for ever doing its duty faithfully and impartially, and when the house rose, all the eloquent and fiery speeches would be found recorded, sound for sound, as they were uttered, without any adornment from the hands of the reporters.

We say that we hardly expect any such high degree of perfection will ever be reached by applying the camera in this way as a recorder of sound; but we should not be at all surprised, nevertheless, to hear of some really useful and interesting results being obtained in the way of photographing tones and speech.

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PHOTOGRAPHY AND POPULARITY.

The photographs one sees in the shop windows furnish a tolerable gauge in the matter of popularity. If, for instance, we wished to know the most popular man at the present moment, whether as actor, author, surgeon, man of science, &c., we could scarcely do better than refer to the photographic dealer for an opinion. He could tell us to within a little the popular estimation of Nilsson, Patti, and Albani, and his judgment would be based on very good data. Statistics might be obtained from him to prove that such and such a Royal personage is increasing or decreasing in popular favour, and to show that while all the world is profoundly interested in one man, they do not care a straw about another. Dealers could tell us of certain personages whose pictures are a drug in the market, and of others who are such favourites that half-crown cabinet portraits of them are rapidly sold.

Popularity of this kind may be of little value, it is true, but still it is popularity; and the *Daily News* the other day, when speaking of the degeneracy of the ballet, made a great point of the photographic portraits of *danseuses* being seldom seen in the shop windows. Our daily contemporary thus writes of photography and the ballet:—"It must not be supposed that the glow of the ballet has departed only so far as England is concerned. In England it is extinct; but everywhere it has faded almost into nothingness. In proof of this assertion, it will be enough to ask where there is a prima ballerina possessing such world-wide ability as is enjoyed by more than one prima-donna of the day; by Patti and Titiens, for instance, or by Nilsson and Albani? Look in those temples of ephemeral fame, the shops of the photographers, and among the 'cartes' and 'cabinets' of actresses of every kind of merit and demerit no portrait, great or small, of any *danseuse* will be visible. The ballet, indeed, was already in a state of decay when photography was invented. The portraits of Taglioni and Ellsler, Cerito, and Carlotta Grisi, were painted, lithographed, and engraved. But the only photographic process known in those days was the primitive, and by no means flattering, one called the Daguerreotype, and the numerous admirers of a popular *premiere danseuse* would not have cared to see her features distorted by any such means. From mechanical, photography has become artistic; and in the present day every pose of Taglioni in *La Sylphide*, or of Carlotta Grisi in *Esmeralda*, would be made the subject of a separate photographic study, which would probably be quite as interesting as the choice pictures of the dancers of thirty years ago from the pencil or the brush of the late Mr. Chalon. The photographers are not to blame. The combat comes to an end when there are no more combatants; and there can be no photographs of eminent dancers if the eminent dancers have ceased to exist."

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PHOTOGRAPHY AT THE AMERICAN EXHIBITION.

We last week gave our readers a summary of Dr. Vogel's preliminary report on the Philadelphia Exhibition to the Berlin Society for the Advancement of Photography. As supplying further particulars, we subjoin his account written to our Philadelphia contemporary:—

"The great International Exhibition is an accomplished fact. All branches of industry from every part of the world have participated in the great Centennial festival of America, and the photographers have not been backward. Worthy of the importance of our art, we see for the first time a photographic hall constructed which contains everything belonging to photography, not pictures only, but also chemicals, apparatus, and accessories. It is the first time photography makes its appearance self-dependent—separated from art, separated from industry. It would have been desirable if this separation could have been extended over the jury also, so that photography, with everything belonging, had formed a separate group; but, unfortunately, this was not possible. The exhibition of the photographic hall has been parcelled. The pictures are given to the criticism of the jury of art; the chemicals are placed in the group of chemistry; the papers belong to the group of paper industry, and the apparatus and lenses to that of the instruments of precision.

"All the photographers have not found a place in the photographic hall; the photographs from Australia, Egypt, India, Italy, and Switzerland, are exhibited in the main building, and we have trouble to find them; in the division of Italy and Switzerland this is entirely impossible without the assistance of the commissioners. The Australian exhibition contains many things of interest and instruction; the photographs are not the very best, but the exhibition represents a picture of life in Australia which in many cases seems to be similar with that in America, only that there the plastic art, as yet, is far, far in the background. We observe in the Australian division some technical photographical works which almost startle and puzzle us—sharp, mammoth pieces, which, notwithstanding several technical defects, deserve to be acknowledged. One of them is the panorama of the city of Sydney, in New South Wales, thirty-one feet in length, composed of twenty-two single pieces, which present an excellent view of the wonderfully situated city. Opposite this mammoth work there are two other prints from large plates, five by three feet, perhaps the largest negatives existing; and this giant work is the production of an amateur, Mr. Holtermann. He was the lucky finder of a large lump of quartz containing gold to the amount of 60,000 dols., and we see his portrait in the middle of the compartment, with his treasure beside him. Another picture shows us the gold in large lumps.

"We wish, for the interest of our art, that the photographers of Australia may make several such lucky findings, and then we hope they will work with the same passion for our art as Mr. Holtermann, and spend a small part of their gold for chloride of gold, for the purpose of the production of photographs.

"Next to Holtermann there is another German, Mr. Lindt, who with his landscape photographs gains honour; they are certainly the best from Australia, and some of them show, indeed, real artistic apprehension. As generally known, Osborne's process of photo-lithography, which at present has a perfect success in America, first saw the light in Australia. It seems as if Mr. Osborne's example is not without some good fruits, for Mr. Sharkey, in Sydney, has sent some very good photo-lithographs.

"Of portrait photographers, I can name only Newman, in Sydney; his exhibits are in the photographic hall. Besides him, there are in the main building many other portrait photographers represented, but without any essentially first-class work. In portrait photography there is certainly much to be done yet in Australia before it will take the high position which America at present occupies. The moon-photography which is taken in Melbourne by means of the renowned large telescope cannot stand a comparison with Rutherfurd's moon-photography. Of more interest are a number (about three hundred) of coloured landscape photographs by R. Dantree, at Queensland, a man of science, whose pictures tell us more than the best book of geography about the new province in the north-east part of Australia, which is rich in gold, lead, copper, tin, and coal (of which giant lumps are exhibited). Besides, there are many other photographs in the same department; they show us the most ugly faces of the Australian natives in life-size. Another province of Australia is represented, namely, New Zealand. Like a mighty alpine land, with real Switzerland scenery, rises this wonderful island above the surface of the ocean. Hot springs flow out of the earth, and flourishing cities are springing up. Of all these wonders photography gives an interesting picture. We see the ice-mountains of the Highland, the geysers, and surprising is the similarity of these photographs with those of the Yellowstone River in Colorado, which Mr. Marshall has exhibited in Photographic Hall. We almost imagine we see the same scenery.

"From Australia to Japan is on the map only one step, and the same it is in the main building. There we find innumerable vases, bronzes, lac-work, all very fine and valuable; but Japanese photographers we find only in Photographic Hall. Baron von Stillfried has sent a very fine collection of landscapes and scenes of Japanese life, which found its place partly in the Austrian department. China has sent no photographs. The Chinamen are fearing, perhaps, the sharp criticism of America. When the German Venus expedition arrived at Chefoo, in China, they met there a Chinese photographer, who took to his heels as soon as he noticed the European colleagues. As afterwards found out, the man had no lens or apparatus at all, but only a number of old negatives in size of carte-de-visite, all portraits of Chinese men and women, which he had bought of a colleague in Hong Kong. When any customer came to him and ordered his picture, he picked out of the number of negatives one that had the most resemblance to the face of the customer, and this was not difficult, for one Chinese face is just as ugly as the other. He made only prints of the negatives, and they found a ready sale. As I am informed in Hong Kong, there is done at present a good deal in negative retouching; thereby the skill is shown less on the faces, but so much the more on the wigs or pigtails, which are made longer and thicker by means of negative retouching.

"From India there arrived only some interesting photographs of architecture, which were sent by the government. Egypt is represented by three very able photographers, whose exhibits are in the Main Building; especially ought to be named Beato and Schoefft. The latter has taken excellent gems of Egyptian life. We feel a kind of longing to see the wonderful land of the Pyramids when we look at the pictures.

"The photographs from Switzerland are also in the Main building. There are fine pieces amongst them; but it is a pity the photographs can hardly be found. I name, at first, Taeschler Bros., in St. Fiden, who have exhibited fine portraits, the backgrounds of which are retouched in the negatives. They take the portrait on plain background, and cover the back of the plate with lac. On this they draw whatever they think to be proper—trees, walls, sea, clouds, &c.—which are then copied in the portraits, and produce a good effect. Of course, this kind of retouching work is troublesome, and it requires a skilful apprehension. Besides Taeschler, I mention as worthy of notice, Ganz, at Zurich, and Charnaud, at Geneva The latter has exhibited a number of very good landscape photographs, amongst them panorama pictures, which are very seldom seen at exhibitions. From Switzerland we count eight exhibitors; but from France only a little more than half the number. I can find no reason for the slight participation of France, for the relations of France and America are intimate enough. The exhibition by Goupil in the Main Building is grand. There we find beautiful relief-prints, and also specimens of the new heliogravures, though not all of them are beautiful. Braun, at Dornach, has sent nothing; but we find exhibits of Walery and Liebert, at Paris, in Photographic Hall; both firms keep up a counterbalance between them; they are working nearly in the same style, which is taken from Adam-Salomon's. Liebert has sent carbon prints, which at present, in Europe, are coming more and more in fashion, and deserve also the attention of the American photographers.

"I cannot forbear observing that there are among the exhibited photographs from all countries many old ones from the Vienna Exhibition. Of special interest are Vidal's photochromic pictures; but they are not by any means coloured photographs taken from nature; the colour is afterwards put on by means of a chromo-lithographic or heliographic process. Vidal is making at first a pigment print, which is overprinted with colours. This process produces pictures which do not look better than overpainted photographs. Should it be cheap enough—which I doubt, judging by their advertisements—it is possibly of some worth for the reproduction of coloured carpet patterns, coloured jars, and, perhaps, paintings. But the exhibited portraits cannot claim a general approbation.

"It would have been desirable if Vidal had sent with the production of an oil painting the original also; then we would be able to judge better about the process."

FRENCH CORRESPONDENCE.

Photo-chromie—French Photographic Society—M. Liebert—Union Centrale of Fine Arts.

I must ask permission, first of all, to reply in a few words to the very courteous and witty letter, signed "Your Correspondent," which appeared in the last number of the Photographic News. I believe, as it is very often the case in many discussions, that we are both really of the same mind, my honourable opponent and myself; and I am persuaded even that if we both wrote in the same language (for I believe him to be a compatriot of mine) there would not be the least difference between us. I am, it is true, enthusiastic about the results obtained by M. Vidal, but I believe "Your Correspondent" would be no less so if he had, like myself, seen the rapid and important progress which photo-chromie has made during the past year, especially from a practical point of view. The photo-chromie works are established in the same *locale* where my journal (the *Moniteur de la Photographie*) is printed—that is to say, under the same direction as the *Moniteur Universel*, upon the staff of which I have also the honour to be. I am therefore daily in the establishment, and have an opportunity of seeing all the new productions by M. Vidal's process. I have seen the workmen at their work, and witnessed the presses in action. Thus I am in a position to state that the process is practicable to a degree, and has attained a state of perfection never hitherto reached. Moreover, the visitors to the special public exhibition now open at 15, Quai Voltaire may easily convince themselves of the number and variety of the specimens produced. So far as regards the details of the manipulations, I repeat that I have no knowledge whatever. Is it just to reproach M. Vidal for not publishing a description of his process? Surely, it is only natural that he should keep a secret which has cost him so much to elaborate. Moreover, did he actually desire to make it known, he could not do so, since the invention now belongs to a company, which has made every sacrifice to work the process upon a most extensive scale. As to the pamphlet to which my opponent refers, this is printed and distributed by the *Administration de la Photo-chromie* for the purpose of calling the attention of the public to the process, in the same way as a prospectus, and may be regarded as "Opinions of the Press," such as are published in England. It is, in a word, a simple form of publicity, and not a technical document. M. Vidal has nothing to do with it; if the pamphlet offers anything to criticise, it is the *Societe de Photo-chromie*, and not he, that should be called to account.

The monthly meeting of the French Photographic Society was held on Friday last, August 4, and it will meet no more till November. The greater part of the active members have already commenced their holidays, and the more zealous think they may do better by resting than employing the time in writing communications, so that the assembly was much less numerous than usual. There was little of interest beyond some presentations made to the society.

M. Laurent, of Madrid, who has a house in Paris, exhibited two magnificent collections of prints. The first was composed of reproductions of the Art Gallery in Milan, printed in greasy ink. The second consisted of prints in silver of various kinds, representing views, portraits, &c., taken in Turkestan by a skilful artist, M. Vereschaguine

A printing frame upon a new model, although no doubt known in America and England, was shown by M. Derogy. In this apparatus the cliché is taken hold of by one of its edges between two pieces of wood, which are clamped together with a screw, and which move upon hinges so that they may be raised or lowered like the leaves of a book. The sensitive paper is placed upon a thick pad of velvet, where two clamps hold it fast. When the negative and the paper, pressed against one another, have been exposed for a certain time to the light, it is only necessary to press a spring in order that the bottom of the frame carrying the velvet pad, and the paper already half printed, may be distanced about a millimètre from the negative. By subsequently continuing the exposure, you obtain those soft prints which in America it is the fashion to call porcelain pictures, and which were introduced some time ago by M. Denier, of St. Petersburg.

M. Schultz presented the society with a pocket photometer, which has the form of a small opera-glass. The scale of tones is obtained by the superposition of small leaves of wax paper applied to glass, which occupy the larger end of the instrument, so that segments of a circle, more or less darkly tinted, are obtained.

M. Koch, one of our most skilful apparatus makers, exhibited at this same meeting an apparatus for dry plates of the most elegant and simple character.

Finally, M. Liebert submitted to the society an apparatus which was not exactly of a photographic nature, but employment of which is nevertheless very useful in many cases, and indeed almost indispensable in the case of operators who practise carbon printing. It was a heating arrangement which furnished almost immediately a supply of warm water, of 50° to 60° Cent., and which was little else than a cylinder of cast iron. Below was a gas furnace, above a very fine net, upon which the water is poured. The liquid thus divided penetrates a large number of little spiral tubes, which the heat at once permeates, so that in a minute or two the high temperature we have mentioned is reached. We had the pleasure of seeing this little apparatus in operation, and it really was very simple and convenient. No doubt the readers of the Photographic News are well acquainted with it, as M. Liebert himself purchased it in England.

Since we have given the name of this skilful photographer, we may mention the fact that he has just put into circulation a new kind of portrait. M. Liebert is the happy father of a charming baby which is to be baptized this very day; upon the cards of invitation which he has addressed to his friends, asking them to the ceremony, M. Liebert has placed a portrait of the newly-born lying full length upon its laced pillow. The idea is well conceived and carried out, and no doubt it will be adopted in more than one household; the little portrait would hold a privileged place in the family album.

The fifth exhibition of the Union Centrale of Fine Arts was opened with much pomp and circumstance on the 1st August at the Palais de l'Industrie. Although the galleries are scarcely furnished, yet we have reason to believe that photography will be very well represented. We have seen some very fine enamels by MM. Gougenheim et Forest, and some excellent portraits by MM. Liebert et Berthaud; a fine and numerous collection of stereoscopic views by M. Block; some interesting copies of art productions by MM. Rossi of Milan, and Laurent of Madrid; an important collection in greasy ink, by M. Thiel. The prints in black and in colour of M. Vidal occupy a special apartment. We know that a large number of other photographers intend to exhibit, and therefore we shall recur once again to this novel exhibition.

Ernest Lacan.

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THE PARIS PHOTOGRAPHIC EXHIBITION.

THE AWARD OF THE JURY.

Astronomy.

MM. Fleuriais, Jannsen, and Mouchet divide the *Diplome d'honneur*.

Medals.—M. Angot, Cazin et Lapied.

Diplome d'honneur also awarded to the Royal Observatory at Kew.

War.

***Medals.*—Captain Savarry, Captain Prudent, and M. Roger.**

State Paper Office.

M. Scamoni receives a silver medal for the prints and blocks obtained by his process.

Public Works.

The School of *Ponts et Chaussees*, the School of Mines, the Department of Lighthouses, divide the *Diplome d'honneur*.

M. J. J. Rodriques, Director of the Portuguese Government Photographic Establishment, receives a silver medal for his improvements in mechanical printing.

For Photographs in Silver Salts.

Silver Medals.—M. Kareline (Russia), M. Naya (Italy).

Bronze Medals.—MM. De Bray, Delon, Denier, Hansen, Shon and Weller, Kösler, Lampué, Molteni, Szdcinski-Chambay, Knebel, Lachenal, Fabre and Co., Levy and Co., Quinet.

Honourable Mentions.—MM. Adophe, Balagny, Czachowicz, Cooper (of Hull), Delarche, Feilner, Guipet, Hirinque, Klary, Link, Mage, Nicola, Schulz-Terperau, Unterweger, Valetto, York (of Notting Hill), Zinsler.

For Photographs in Carbon.

Silver Medal.—M. A. Braun (Dornach).

Bronze Medals.—MM. Haertwig, Offenberg, Deroche, Gougenheim, Liebert, Rentlinger.

Honourable Mention.—MM. Halley, Pector, Zeyen.

Photographs in Greasy Ink.

Silver Medals.—MM. Gillot, Jacobi, Thiel, Vidal.

Bronze Medals.—MM. Braunerk, Brusa, Franz, Quindic, Arosa, Fortier fils, Geymet, Relvas.

Application of Photography to Science.

Silver Medal.—M. Raolt (France).

Bronze Medals.—MM. Dagron, Fritsch, Luys, Ozanam, Ducos du Hauron, J. Girard.

Honourable Mentions.—MM. Souza, Guidi, Truau.

Photographic Apparatus.

Silver Medal.—M. Joute.

Bronze Medal.—M. Derogy.

Honourable Mentions.—MM. Audonin, Bauz, and Herzog.

Not in the Competition.—Professor A. Girard, and M. Rousselon, Director of the Photographic Works of MM. Goupil et Cie.

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ORNAMENTATION OF GLASS BY ETCHING AND PHOTOGRAPHY.*

Carbon pictures are easily transferred to glass, and when they are bordered by an ornamental margin etched upon the glass surface their appearance is greatly enhanced. In some cases the pictures are covered by a glass plate, and this also is easily ornamented. M. E. Seigwart has given some particulars about etching upon glass which will be interesting to photographers.

Since fluoric preparations have been produced at reasonable prices, the decoration of glass by their means has steadily made its way. Etched glass is now to be found everywhere, and glass etching runs glass cutting very hard. It is easy to understand that well-etched objects appear actually more beautiful than those which have been cut. The cost of production is cheaper, and since M. Hock, a Viennese chemist, has given us an elaborate work upon the techniques of glass etching, the difficulties attending this kind of work have been reduced to a minimum.

As is well known, fluoric acid usually etches smooth, while other fluoric preparations yield a matt surface. The most beautiful ornamentation is obtained when certain parts of the glass surface are rendered matt by means of fluoride of ammonium which has been slightly acidified by means of acetic acid. The matt appearance is not always the same with different kinds of glass, but varies much in beauty; this effect is governed by the composition of the glass, lead glasses being easily acted upon, and furnishing a very fine matt surface.

Where it is desired to have the surface of the glass not altogether matt, but shining like ice, as in the case of window glass, this may be attained in a simple manner by placing the glass plate in a perfectly horizontal position and covering it with fine groats. Then very dilute fluoric acid is poured upon it. The groats act as a shield, and produce upon the glass raised points.

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* *Photographisches Archiv.*

Several ways exist of etching photographs on glass. A good result may be secured by covering the surface with a solution of gum made sensitive with bichromate of potash, and printing the same under a negative; after the image has been thus produced, it is dusted over with minium or red lead, and the red picture thus obtained is fixed and burnt in, in the usual manner. The easily soluble lead glass, so obtained, is treated with strong sulphuric acid, when a white matt design is produced, and the picture appears by transmitted light as a positive.

Correspondence.

PHOTOGRAPHING AT A BAZAAR.

Dear Sir,—It has been my lot recently to photograph at a bazaar. Thinking an account of my doings may be amusing to some of your numerous readers, I send it. As the proceeds of my work were to go to the bazaar, you will see I was more anxious it should answer. The gentlemen, of course, who engaged me paid me a fixed sum. Having got all things ready I set out. When I got there a very nice little tent was put up for showing specimens, &c.—in fact, a "reception room" on a small scale—but as for a suitable place for doing my photography, nowhere could I find it (as the bazaar was held in a park); so I had to make shift at the back of my tent, which was luckily dark, and I managed to secure some very fair pictures.

The first people who came were the Northampton Rifle Corps band; they came up very nervously, and, of course, said my prices were too high; so then I had to give information about who had arranged these "woeful prices." One said it was too much; another, absurd, &c.; but at last they agreed to pay, and I secured them. Next came a lady with three children, and then I saw my trials were about to begin. She began by saying, "Now I don't want to be told when you take my photo." She assured me she never came out well if warned previously, &c. But at last I managed to satisfy her after three attempts, and she ordered copies very liberally. I took altogether about fifteen photos. from two to six o'clock, which was very fair, considering my tent was so far from the main body of tents. The next day was the sixpenny day, and as we have a very large quantity of ironstone about here, you may judge of the appearance of the sons of toil. Certainly the Northampton Rifle Corps patronized me more than the aristocracy. But they would look into my tent, in spite of all I said. I saw one man fiddling with my cyanide bottle. I warned him rather too suddenly, and smash he let it fall on the ground; all lost, of course. I luckily had some more made up. The babies on this day were something which, as Mrs. Jorrocks says, are "certain cares, but very, very uncertain comforts." My formula was the following: Huggin's collodion nitrate bath—Mr. Edwards' formula—nothing better. I have never had a stain or pinhole since I have used it.

Iron Developer.

Proto-sulphate iron	1 oz.
Acetic acid	1 oz.
Alcohol	2 oz.
Water	1 qt.

Pyro re-developer.

I remain, yours truly, C. R. P. Vernon.

COLLODIO-BROMIDE EMULSION.

MR. NEWTON'S FORMULA.

Sir,—In the 9th of June number of the *British Journal* there appears a letter from Mr. M. Carey Lea, intended as a reply to my letter refuting the charge of plagiarism, which Mr. Lea had made against me. Mr. Lea in his reply has evaded *all* the essential points that I made, and, instead of offering any proof, appears to rely entirely upon bare assertions. Mr. Lea states that the two processes are identical.

I propose to give the two formulæ side by side, and let intelligent photographers, who are interested enough to read them, form their own opinions from the *facts*.

Mr. Lea says he *intended* no charge of plagiarism. What he intended, he, of course, knows better than any one else. What he actually *did* is what I have to do with, and he understands the English language well enough to know that his note headed with my name, published in the *British Journal* on the 25th of February last. contained a direct charge of plagiarism on my part. Mr. Lea gives as a reason for making this charge, that he had noticed an article which I had written making comparisons between the processes in question, unfavourable to the one he especially recommended.

In reply to this I denied having ever written anything of the kind, or having ever made any unfavourable comparison between his formula and mine, or the formula of any one. I called upon Mr. Lea for the proof, the time when and place where.

Mr. Lea must feel that he owes me an apology for making such a statement, which is devoid of every element of fact to justify it; and especially as he makes this the reason for his first attack upon my integrity.

Mr. Lea regrets that I am so personal. He made it a personal matter purely from the first; his regrets in that direction should have commenced last February. My effort was to vindicate myself. I had no faith in my ability so to use the English language as to do that and please Mr. Lea at the same time.

Before giving the two formulæ, I should state that the paper which I read before the Photographic Section of the American Institute on the 4th of May, 1875, was mainly a recital of experiments in several formulæ as given. The principle is the same in all, however. Mr. Lea's formula, published March 12th, 1875, is headed thus, in small capitals: "*Chloriodo-Bromide Emulsion with* EXCESS *of Alkaline Bromide.*" He then proceeds: "The formula for the emulsion is the same precisely as the foregoing, except that the *aqua regia* is omitted, and the proportion of the silver nitrate reduced. In this case the collodion requires, for exact saturation, eighteen and two-third grains of silver nitrate; seventeen or eighteen may, therefore, be added. Of course if we attempt to come so near as eighteen grains, it will be necessary to be very exact in all measurements and weighings. If seventeen grains be used, so much exactness will not be required; but a slightly inferior degree of sensitiveness may be expected. *As in the former case*, the cupric chloride should be added last. With this emulsion the addition of the cupric chloride after the silver nitrate has this further advantage, that the emulsion is thus left for a time in presence of excess of soluble silver salt, which is favourable for sensitiveness."

May 4th, 1875, I said in my paper read before the Photographic Section of the American Institute: "I finally adopted the idea of making my emulsion with the silver in excess, and after a certain period of time convert the uncombined silver into a chloride of silver by the addition of some of the soluble chlorides, adding sufficient to leave an excess of chloride in solution. In this way I obtained the bromide of silver in a state of equilibrium.

Formula.—"Collodion, ether, five ounces; alcohol, three ounces; cotton, seven grains to the ounce; bromide of cadmium, twelve grains to the ounce; silver, eighteen grains to the ounce. fifteen grains being necessary to take up the bromide. This, after remaining twelve hours, had two grains to the ounce added of chloride of cobalt or chloride of calcium."

The paper from which the above is an extract was mainly devoted to describing a series of experiments based upon the fundamental idea of adding more silver than was necessary to combine with the bromide in the collodion, and permitting the excess of silver to act upon the organic matter of the collodion for a number of hours, and then freeing the emulsion from the free silver by the addition of a soluble chloride. I had varied the time from three to thirteen hours. I have selected the above from the several given, because it was the one which I adopted, as will be seen by my remarks at the next meeting of the Section, June 1st, with a slight modification of the time which should elapse between the adding of the silvor and chloride. In my 4th of May paper I stated that my experiments with a chloride in making bath dry plates led me to apply the principle to emulsion. My use of a chloride in making bath dry plates had been published several times, and was again recited in that paper. Mr. Lea now claims that the idea which produced his formula as given above, and my experiments and formula selected from the 4th of May paper, were identical.

Unfortunately for Mr. Lea, his formula states directly the opposite, and it is not until the 25th of February, 1876, nearly a year after, that Mr. Lea makes the statement that the inspiring idea which produced the formula in question was the same as mine, as expressed by me in the month of May preceding.

Up to the 25th of last February there is no hint or suggestion that he ever thought of making an emulsion with the silver in excess, and leaving it in that condition for *six hours* or any *definite period of time*, and then taking up the excess of silver nitrate with a chloride. Mr. Lea says on the 25th of February, "It occurred to me last winter to try a process in which silver nitrate should be added to a collodion in quantity such as to bring it to a moderate excess, and later to add chloride in such quantity as to entirely decompose the silver nitrate, and leave a moderate excess of soluble haloid." This language was used by Mr. Lea for the first time more than nine months after I had read my paper, and in the main is a quotation from it. It is simply amusing to see with what persistent effort Mr. Lea tries to make this language fit his formula of the preceding year. He even suggests that the heading of his formula should be changed to make it cover.

Mr. Lea, in his remarks published June 9th, says: "Mr. Newton cannot deny, neither does he, that this is the cardinal point in my process." Mr. Lea here labours under a great mistake. He must have read in a very careless way what I wrote on that subject. I denied that any such idea existed in the formula, and published the formula with comments, showing conclusively that no excess of silver nitrate was possible if the statements in the formula were correct. I not only denied this, but went further and denied that any one who had read it had discovered that it contained the idea which he now claims it does.

Mr. Lea is not pleased with the manner in which I alluded to his Note-book. It is a very simple matter for us to justify ourselves for the view we then and still entertain on that subject.

The testimony on this subject is conflicting, as it is in reference to the fundamental idea that inspired the formula in question. Nearly a year after the formula was published, Mr. Lea makes a statement on this subject in direct conflict with the formula as published. When we are met by such conflict we are compelled, in order to arrive at a rational conclusion, to analyze and understand as far as possible the whole tenor of the letter in which they occur. I choose to believe that what Mr. Lea had in his mind, and what he intended to do when he wrote that formula, are fully set forth in the heading. The formula is in perfect harmony with it, and Mr. Lea's effort to change the heading to make it harmonize with his recent interpretation is very weak.

Now about the Note-book. On the 12th of March, 1875, Mr. Lea publishes a letter in the *British Journal*, in which he gives two formulæ which he says he has adopted, one with an excess of silver, the other with an excess of bromide. It is well known that Mr. Lea has been engaged in experimenting on emulsions for several years, and that some, at least, of his efforts have been directed to produce an emulsion with excess of nitrate of silver with, at the same time, good keeping qualities. The concluding lines of the introductory part of the letter above referred to is as follows:—"The formula for the *forms* of the chlorido-bromide process, which I have *adopted*, are as given below." Then this formula is given:—"To the ounce of plain collodion—which should contain three parts of alcohol and five of ether, both of high grade, and eight grains of pyroxylin to the ounce—add

Dried cadmium bromide	8 grains
Ammonia bromide...	$2\frac{1}{2}$,,
Ammonia iodide	2 ,,

Two drops of aqua regia to the ounce are to be added. The mixture is to be sensitized with twenty-four or twenty-five grains to the ounce of silver nitrate, and after sensitizing, two grains to the ounce of cupric chloride are to be added. This should be added *after* the sensitizing, *because*, if added *before*, the collodion becomes dark and discoloured in consequence of the formation of cupric iodide."

This formula, with the one given before, are the ones which Mr. Lea says he has adopted. This one is, however, given first, and is the one alluded to in the one which he claims as the same as mine, where it says, "the formula for the emulsion is the same precisely as the foregoing," and also refers to this formula, where this language occurs, "As in the *former case*, the cupric chloride should be added last." Now, is it probable or even possible for Mr. Lea, in publishing a formula for any chemical compound where the ingredients are put together in the ordinary way, would omit to state the fact, if he knew it existed, that six hours should elapse between the adding of one of the ingredients and another?

If Mr. Lea succeeds in making photographers believe he is capable of writing in such a loose and careless way, he will not gain much credit, even if he should succeed in making them believe also that he is the real author of my process, which he appears to think is comparatively worthless. It should be especially noted that the reasons which Mr. Lea gives for adding the chloride last in one formula existed in both, and it is plainly evident that this reason was the one in his mind when he says, "as before, the cupric chloride should be added last."

By referring to my remarks at the meeting of the Photographic Section of the American Institute, October 5th, I find that I then, after giving my reasons, gave a formula in which I fix the time to add the chloride at six hours after the silver.

This was the result of a long line of experiments, and fixed it as the best, all things considered.

Between four and five months after, Mr. Lea claims to have found the same thing in his Note-book, a most singular and extraordinary coincidence.—Yours truly,

New York, July 14th, 1876. Henry J. Newton.

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Talk in the Studio.

Photographic Exhibition in Glasgow.—We learn that it has been resolved to have an exhibition of photographs in Glasgow during the meeting of the British Association. Particulars will be found in our advertising columns.

Patent Office.—Several changes are about to be made in the arrangements of this office. An order has appeared which puts an end to the abridgments of provisional specifications which have since 1866 been required from each applicant with his provisional specification. This will be some relief to inventors, and it is only an official acknowledgment of a fact that has long been obvious to all concerned, that these so-called abridgments were almost useless. This order has taken effect. Notice is also given that in future the drawings accompanying specifications will be reproduced by photo-lithography, and the copies of the originals filed for the purpose of reproduction are to be sent in a condition such that they may be copied by means of photography. It is understood that it is intended to make a considerable reduction in the scale on which the drawings are published, with the object of economizing space and lessening the cost of printing. In order to give time for the examination of the filed drawings the Commissioner of Patents requests that they may be sent in at least six days before the expiration of the time allowed, thus limiting by a week the six months' provisional protection granted under the Act of 1852.—*Stationer.*

New Style of Cabinet.—"Mr. Warwick Brookes, of Manchester," says the *Morning Advertiser*, "is introducing a new kind of photographic portraiture styled the 'Academy Portrait.' The subjects so far published are symbolical, the likeness forming the centre of the picture, the decorative surroundings being emblematic of Literature, Art, Drama, Music, and Freemasonry. These accessorial details form a sort of frame to the portrait. The photographs are highly finished, the minutest details being brought out with perfect distinctness. There is no doubt the new style of cabinet portraiture will meet with much favour."

To Write upon Glass.—M. Tergnem has communicated to the *Societe Industrielle du Nord*, of France, a process which permits of very permanent writing being done on glass with ordinary or India-ink. For this purpose the surface of the glass is gently heated over an alcohol lamp, or Bunsen gas-flame, until the vapour of water ceases to condense upon it, when it is to be coated with a varnish made after the following recipe: The materials are, 80 grammes of alcohol (90°), 4 grammes of mastic, and 8 grammes of sandarac. This mixture will be dissolved by heating it over the water-bath in a flask well stoppered and tied. This varnish is very hard, and ought to be completely transparent; if the surface over which it is poured is cold, it becomes opaque. The glass surface, coated in the manner described, may now receive any design or sketch drawn upon it with ordinary ink or india-ink. It is then covered with a film of any non alcoholic varnish. This procedure may be advantageously employed as a substitute for the labels commonly used on bottles in the laboratory and elsewhere, to draw or trace sketches on glass for magic-lantern projections, &c.

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To Correspondents

Anxious.—1. We suppose you allude to reproductions of line drawings when you say you want to force thin negatives. Under these circumstances iodide of potassium and bichloride of mercury may be used with effect; but such treatment is far too severe for ordinary negatives. The following plan will answer your purpose. Fix and wash your thin negative, using plenty of water. Intensify in the ordinary manner with pyrogallic acid and silver, going as far as you pretty well can. The negative will still be thin after such treatment. You then wash thoroughly, and immerse the negative in a saturated solution of bichloride of mercury. Wash again well, and then pour over a solution of iodide of potassium, one grain to the ounce of water. Wash thoroughly once more, and blacken the film with

Liquor ammonia ... ... 1 part
Water... ... ... 8 parts

Finally, wash again. 2. A good plan to keep collodion plates damp for a long time is to moisten a thick sheet of blotting-paper (coarse filter is suitable) in distilled water, and allow this to adhere to the back of the plate. If the dark slide is kept wrapped round with a waterproof, when not in use, to prevent too rapid evaporation, this method will serve to maintain the film in a cool moist state for an hour or more; it is a better plan than tampering with the film in any way. 3. The Eburneum process was described by Mr. Burgess in one of the earlier Year-Books.

Palmam qui meruit ferat writes on the gelatine pellicle controversy, charging Col. Wortley with a similar reticence in communicating information to the public to that with which he (Col. Wortley) has charged Mr. Kennett, and asking him when the book promised more than two years ago is to be given to the public. The letter deals rather with Col. Wortley's alleged shortcomings than the question in discussion.

J. J. (Warsop).—The best lens for all purposes—landscape, architecture, groups, and portraiture, in the open air—is No. 4 on your list. No. 5 is also good, and better than 4 for portraiture. It will take cabinets if you have length enough in your room. The maker will tell you the exact length required.

C. W. E.—Reversed positives upon wood blocks may be secured by simply employing reversed negatives. A reversed negative is secured by taking the image in the camera through the glass, or, better still, stripping the film from the glass after the negative has been taken. Warnerke's tissue lends itself very readily to the production of film negatives, which can be printed from either side. A film negative is much better for printing upon wood blocks than a glass one, as it is easier to get the two surfaces in contact. Several methods for printing upon wood have been detailed in the News from time to time, and about a year ago a means of utilising the carbon process in this direction was given in "Photography In and Out of the Studio." A reversed positive image is easily produced by developing exposed carbon tissue upon the wood block, and in this way there is scarcely any film produced in the high lights. There is, however, no "royal road" to printing upon wood, and those who succeed do so more by skill and practice in the manipulations than by any secret or dodge in regard to it.

Tyro.—If you will supply us with the details of the printing process you employ, we will try to help you out of the difficulty. The prints you enclose are flat and mealy, as if stale paper had been used.

Printer.—1. Certainly. 2. If you employ so strong a bath for sensitizing your paper first of all, it will be necessary to *wash* it, should you desire its preservation for any length of time. Paper sensitized on a weaker bath is simply dried by pressure against filter paper. You must keep such sensitized paper sealed up against air and light, and then it will keep good for weeks, nay, even months. Your method of fuming the paper with ammonia, prior to printing, should answer very well.

Carbon.—Write to the Autotype Company; they will be able to explain the matter better than we can. See announcement in last week's News.

The Edinburgh Photographic Exhibition.—We received last week—too late for insertion—a note from Mr. Bashford, regretting that as Mr. Williamson was from home he was unable at once to reply to Mr. Neilson's letter in our issue of July 21.

P. A. Tent sends us a *jeu d'esprit*, entitled "On a New and Improved Method of Mounting Large Photographs," which he intends to patent. When he does so he must send us the specification for publication.

H.—The specimen you send is not bromide, but iodide of cadmium.

Self-taught.—The design you send is certainly very finished. We think there should be a little more sorrow depicted in the face to give the aspect of mourning.

X. Y. Z.—The stains are undoubtedly due to hypo. You have, no doubt, put down the prints in a dirty place after they have been washed, and hence they have become contaminated.

Inquirer.—You may not copy without permission. The proprietors of *Punch* are exceedingly chary about giving permission for the reproduction of sketches in that publication. You may write to the office, in Fleet Street, but we do not think you will obtain it.

Dry Plate.—See our advertisement columns. The address of M. Warnerke is Linden Grove, Peckham, S.E.

A.—In September; there was an announcement in our columns last week.

In Difficulties.—We cannot recommend anything for your bath; according to your description it would seem hopeless to do anything further. Are you sure it is the bath that is at fault? The fogging and unsharp pictures might be produced by light acting upon the film previous to exposure. Before you do anything more, sensitize a plate, leave it five minutes in the dark room, and then develop. If your room is light proof, the plate should develop perfectly transparent without any sign of fog. We are sorry we cannot help you with any further advice.

C. Ferranti.—Letter and parcel both to hand.

G. H. B.—The defect you mention is a very common one in hot weather; it is the high temperature that is at fault, and nothing else The addition of one or two drops of water to the ounce of collodion sometimes obviates the difficulty.

Leo.—We are sorry to say we cannot give you the information you ask for.

W. E. Lindop.—The Autotype Company alone make carbon tissue, and none but licensees of the Lambert process are supplied with the special materials manufactured by the Company for working the process. To obtain the ordinary tissue you need, however, only enter into an arrangement with the Autotype Company. We cannot actually advise you one way or the other.

S. P.—Pure iodine is not used in developing under ordinary circumstances. Iodide of potassium is sometimes employed for intensifying, &c. 2. The defect you mention is due solely to hot weather; if you can cool your dark room and solutions, you will be troubled no longer.

Several Correspondents in our next.

The Photographic News, August 18, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

What is Phosphorescence?—Science under Government Protection.

What is Phosphorescence?—The phenomenon of phosphorescence has often troubled the chemist and the photographer, and there are no doubt among our readers some who have, at one time or another, endeavoured to obtain reflections of phosphorescence upon the photographic film. We have never heard of the attempt proving successful, for the luminosity given off is, after all, so faint that such a result is hardly to be expected. We see that a German philosopher has recently been directing his attention to phosphorescence, not from a photographic point of view, however, but in order to discover, if possible, the true cause of the remarkable phenomenon. The result of his investigation is that he is enabled to confirm the conclusions arrived at by others—such as Hulme, Placidus, Heinrich—who have worked in the same direction. The simplest mode, so it appears, of bringing about phosphorescence is to place marine fish in a three-per-cent. solution of salt, and, according to M. Pflüger, the phenomenon may be observed the second evening. The luminosity, M. Pflüger tells us, begins in the eyes, and thence spreads all over the fish, increasing in intensity from day to day, its duration depending upon the temperature. The luminosity is of such a nature that the fish appears, after a time, to be luminous all through; but this is not the case, for, on scraping off the surface, it is quite black underneath. The luminous matter is, indeed, a kind of slime, which is perfectly apparent in daylight, when it is of a dirty-white colour; it is only in the dark that it shines with a phosphorescent lustre. It appears that pretty well any animal matter may be rendered phosphorescent by applying to the surface some of this slime, or, in other words, can be infected by the slime. M. Pflüger has examined the slime under a microscope, and it was found to contain a mass of schizomycetes, which, from the fact that they moved actively about, were doubtless alive. Hence he concludes that the small living cells of the schizomycetes are the luminous agents. The animalculæ, he points out, are not so small that they cannot be filtered from any water in which they may happen to be. M. Pflüger in his paper proceeds to give the results of investigation of other decaying matter in which phosphorescence is observed; but we need merely quote the summing-up of his conclusions in respect to this mysterious question—viz., "all phosphorescence of decaying organisms is the luminous respiration of living parasites."

Science under Government Protection.—The question of establishing a permanent Museum of Science was last week brought to the attention of the House of Commons by Mr. Reed, who desired to know if it was true that a memorial, signed by many of the most eminent men of science in the kingdom, had been presented to Government, urging that such a step should be taken. We cannot help thinking that Government is in the right in not rashly taking immediate steps to carry out the suggestion. After the poor success of the Scientific Exhibition at South Kensington, which, from first to last, must have cost a sum of money out of all proportion to the results, it is well, surely, not to act precipitately in any movement of a like nature. We have already many establishments of a scientific character supported by Government—the British Museum, School of Mines, Kensington Museum, &c.—and an additional branch to any one of these would suffice to meet most of the requirements at present existing. The cry for a Museum of Science, like that for the endowment of research, is, to our thinking, of no considerable moment. Indeed, lately we have had rather too much talk about "the cause of science," and about the aid that should be rendered on all hands in its progress. The grand discoveries of the present and past century were not due to investigators who were paid to investigate, and it is very likely that had some of our great inventors or discoverers possessed a comfortable competency they would not have pushed forward their work to so successful an end. At any rate, there is no reason to believe that a paid investigator will discover more than an unpaid one. Confining ourselves more especially to the photographic world, it would be difficult to point to any invention that has been developed by a paid investigator. Daguerre and Niépce's son both received pensions for work that had been done in photography; but the life-long investigation was not carried on with a view to earning such pension, but for the honour of being able to solve the difficult problem these men had taken in hand. Again, the sum of ten thousand francs, which was left by the Duc de Luynes to favour photographic progress, cannot be said to have had the least influence in doing so. We do not find fault with the decision of the jury which awarded nearly the whole of this magnificent sum of money to M. Poitevin, but we do affirm that the reception of any such encouragement was far from the mind of the lucky competitor when he was undertaking his work. Take, again, the case of the Royal Society. Is it those, we ask, who receive yearly grants to enable them to conduct certain researches who contribute the best work, and communicate from time to time the most interesting results? Far from it. Indeed, if the results could be tabulated, it would be found, we think, that very little good indeed has come from researches that have been paid for in this manner. One can scarcely imagine that any grand work could emanate from a paid philosopher pursuing his investigations in a John-trot manner—working methodically so many hours a day, as if he were a grocer's assistant. If a man believes he is in the way of making a grand discovery, he does not pause to ask for money to pay for the pursuit of his investigation. It is for these reasons that we do not believe that much benefit can possibly arise from the endowment of research, or from Government going out of their way to aid in supporting scientific men. A man making a discovery of importance is usually recompensed in one way or another; he makes a name or he makes money, and these are pretty well the same thing in this world. Such men as have made merely abstract discoveries of late years have not been forgotten by the world, but have, in some cases, prospered to a marvellous degree; while others, whose inventions have had a commercial bearing, have many of them built up colossal fortunes in a few years. We cannot help thinking, therefore, that there is not much to be gained by Government interference.

PHOTOGRAPHY IN CONNECTION WITH THE OBSERVATION OF THE TRANSIT OF VENUS AT ROORKEE.

BY CAPT. J. WATERHOUSE, ASSISTANT SURVEYOR-GENERAL OF INDIA.*

Shrinkage of the Collodion Films.—When it was first proposed to employ photography in observing the Transit, it was objected that the collodion processes would be unsuitable on account of the shrinkage or contraction the collodion films undergo in drying. De la Rue in 1861 made some very careful experiments, the result of which was to show that, with proper precautions, the shrinkage was entirely in the thickness of the collodion film. More recently, however, Paschen had found this contraction to amount to not less than $\frac{1}{1856}$ of the length of the plate with albumenized plates, and to $\frac{1}{2128}$ of unalbumenized plates; in one instance it being so much as $\frac{1}{523}$ of the length and $\frac{1}{618}$ of the breadth of the albumenized plate. Rutherford, on the other hand, found that if the plates received a preliminary coating of albumen, the shrinkage f the wet film, in drying, did not exceed $\frac{1}{4800}$″, and was, on an average, about five times less. Professor H. Vogel, of Berlin, also made some experiments on the conditions affecting the stability of the collodion film, which proved the value of a substratum as a preventive of contraction of the film, and showed that dry plates were less liable to contraction than wet. Captain Abney and Colonel Stuart Wortley, when experimenting on a dry process to be used for the Transit by the English expeditions, also gave this subject their careful consideration, and came to the conclusion that, with proper precautions, the amount of shrinkage would be so small as to be negligible. Notwithstanding this concurrence of testimony as to the possibility of disregarding the contraction of the film, I thought it desirable to satisfy myself as to the suitability in this respect of the various dry processes I was trying, and the plates were therefore tested by a method which I afterwards found was somewhat similar to that followed by Dr. de la Rue, and appeared to have the advantage of entirely avoiding any chance of error from parallax caused by want of absolute contact between the test lines and the collodion film. Several glass plates, five inches square, were prepared by drawing on them, with a very fine diamond point, diagonal lines through the corners of the plates. With the intersection of the diagonals as a centre, a circle was described four inches in diameter, so that it might correspond in size with the solar disc on the plates to be taken during the Transit. These test plates were then coated with the usual albumen substratum, and prepared exactly in the same way as the dry plates under trial. They were exposed to light from the back, so that an impression of the engraved lines was obtained through the film. The plates were then developed in the same way as the other plates, and when dry, examined under a very powerful micrometer, capable of dividing to the $\frac{1}{100000}$ of an inch. To facilitate the examination, a piece of the film was cut away across the lines in different parts of the plate, and the course of the uncovered part of the line compared with the covered part. In no case was any perceptible difference found, except when the substratum had been purposely omitted, or processes used which gave rise to blistering of the film. The only chance of error I could see in this plan was the sticking of the film to the rough surface of the engraved lines; but in the cases where the film blistered it was found that the blistering was more marked on the lines than elsewhere, and so it would appear that the lines did not exert any particular influence on the free motion of the film. I had not time to go into the subject very thoroughly, nor the means of trying other tests.

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* Continued from page 377.

Arrangements of the Observatory.—I arrived at Roorkee on the 13th October, and thus had about eight weeks for preparation. Colonel Tennant had built an observatory with domes for all the observing instruments, and had allotted to me a very convenient dark room about ten feet square, attached to the dome in which the photo-heliograph had been erected, and separated from it by a narrow passage about seven feet long and three feet wide. I had doors placed at each end of this passage, so that communication could pass between the dome and the dark room without letting light into the latter; and in order to avoid the necessity of constantly opening the doors for the passage of the dark slides to and fro, a sort of box opening at both ends and large enough to hold a dark slide was let into the panelling of each of the doors, and the dark slides were thus easily passed backwards and forwards, without any risk of letting in light or raising of dust. Double doors were also constructed at the entrance to provide for communication from outside without interruption of the work going on within. Tables and shelves were arranged in the dark room so as to keep all the operations and the necessary chemicals and appliances for each quite distinct; thus there was a table for the nitrate baths, and near it shelves for the collodions and plates boxes. Another table, with sink, was set apart for developing, and close by were shelves for the developers and chemicals, &c., used for developing. A third table was used for changing dry plates, and above it were shelves for the dry plate boxes. Some such system was absolutely necessary in such important operations, and the principle of a place for every thing and everything in its place was rigidly adhered to.

As it was undesirable to use the dark room in the observatory for the preparation of plates and chemicals or as a store-room, nothing was kept in it except the chemicals and apparatus actually required there. A dark room for the preparation of dry plates, testing baths, &c., was fitted up in a house immediately opposite the observatory, and here also all mixing of chemicals, cleaning plates, and other preparatory work was carried on, and spare stores kept.

The photo-heliograph had been erected by Colonel Tennant before my arrival on an isolated brick pillar in the centre of a circular room twelve feet in diameter, fitted with a revolving observatory dome.

It was arranged that the times at which the several photographs were exposed should be recorded by electricity on a chronograph placed in an adjoining room in electric communication with the standard clock, which also gave the time to a clock-dial placed in the dome.

This was effected by the use of a tappet or make-circuit key, to which Colonel Tennant had very ingeniously fitted a pair of scissors, so that the act of cutting the thread to let loose the exposing shutter of the photo-heliograph completed the circuit, and the exact time of exposure was thus instantaneously recorded on the chronograph. The Janssen slide was also fitted with arrangements for being placed in electric communication with the chronograph, so that every turn of the winch was recorded at the moment of exposing each picture round the circumference of the plate.

The staff of assistants at my disposal included three European assistant-photographers, Sergeant J. Harrold, R.E., of the Photographic Branch Surveyor General's Office, Calcutta; Lance-Corporal George and Private Fox, of H.M.'s 55th Regiment, who had been thoroughly trained by Colonel Tennant in the ordinary manipulations of the wet collodion process; with three native servants for handing the plates to and fro and performing other menial duties.

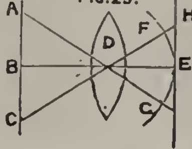
(To be continued.)

A LECTURE ON LENSES.

BY JOSEPH ZENTMAYER.*

We now come to another aberration of a lens, the curvature of field. The image of a flat object, formed by a lens, cannot be received on a plane screen; the screen ought to be concave. A, B, and C (Fig. 23), are very distant points, and, therefore, nearly equal distant from the lens D, of which the point B is situated in the line of the axis of the lens, while the points A and C are above and below the axis. It is evident that the images of these points are formed at nearly equal distances from the optical centre, not far from the principal focus. The field F E G is therefore curved, and cannot be received on the screen H I equally sharp. The curvature of field is generally attributed to spherical aberration; sometimes it is even thought to be spherical aberration itself, but it has nothing to do with it. If lenses could be made with parabolic curves, free of spherical aberration, the curvature of field would be about the same.

FIG.23.



Suppose we have a globular lens A (Fig. 24), with a diaphragm in the middle, so small as to reduce spherical aberration to almost nothing. Now we know that the focus of a sphere of crown glass is situated $\frac{1}{4}$ of the diameter behind the globe at B, and as all the pencils are normal, they all will form their image $\frac{1}{4}$ of the diameter of the globe behind it; that is, the image lies in a curve, concentric with the lens, although the spherical aberration is not perceptible. To understand the correction of the curvature of field, we must make clear what is meant by depth of focus, and what the effect of a diaphragm is. Depth of focus is the property of a lens to give a tolerably clear image of objects not in one plane. Figs. 25 and 26 will make it plain. In Fig. 25 we make use of the whole aperture of a lens, D; R R are parallel rays, striking the margin of the lens. The image is formed at a screen, A; if the screen is moved to B or C, the image of the point *a* spreads out, because the angle of the crossing rays is large. When the same lens, D (Fig. 26), is provided with a diaphragm, so as to reduce the aperture considerably, the focus of the rays R R is still at *a*. If we now move the screen the same distance as before, to C or D, we find that the image of the point *a* is considerably reduced. If we now look at Fig. 23, we see that only E can be sharp on the screen, and if the screen be moved towards the lens until the points F and G are sharply defined upon it, then the point E will lie beyond the screen and become indistinct; but if we provide the lens with a small central diaphragm, we can find a place for the screen, where all three points can be brought to it, without the images being sensibly diminished in sharpness.

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* Continued from page 365.

FIG. 24.

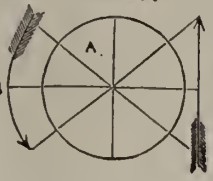


FIG 25

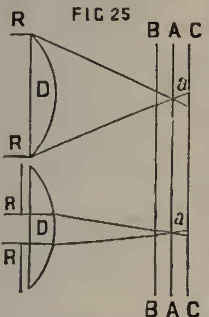


Fig 26.

Now let us see what takes place if we move the diaphragm to a proper distance from the lens. A, B, C (Fig. 27), are distant points, L a converging lens. Let us trace the course of the rays, commencing from the points A, B, C. The rays from the points B, situated in the axis, and the image of the point B, will be formed at F, the principal focus. But it is different with the rays coming from A and C. The rays proceeding from the point **A—**$\mathbf{A}_{i}$, A_{ii}, A_{iii}, A_{iv}, A_{v}, are refracted to *a*, *b*, *c*, *d*, *e*; similarly the rays from the point C are refracted to *a*′, *b*′, *c*′, *d*′, *e*′; occasioning, as we have seen before, spherical aberration. If we place a screen at the principal focus F, it will not receive a distinct image, even if we have a concave screen; as will be observed, all the rays outside of the axis arrive at differen distances behind the lens. You notice that none but the rays A_{v} and $\mathbf{A}_{v}$, and C_{4} and C_{5}, have their focus near the plane of the screen M N. Now if we find a place for a diaphragm, so that only these rays pass the lens, and the depth of the lens is as great as *d* M, we may expect a pretty sharp image on a plane screen. By looking over the figure, we see such a plane is in O P (Figs. 27 and 28). A diaphragm in this place, and of the proper size, will allow only the most favourable rays to pass, and a tolerably flat and sharp image is obtained. The smaller the diaphragm, the sharper and flatter the image. But, as we mentioned before, small diaphragms have the disadvantage that the light is cut off to such an extent; and for most purposes the lens becomes useless. But suppose we would employ a negative lens under the same conditions, we would have no real image, but a virtual one; the curvature of the field would be reversed, and the marginal rays have a longer focus than the central ones. Therefore, it is possible to associate a negative with a positive lens, and to render the field flat.

FIG 27

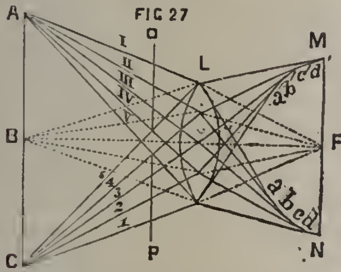
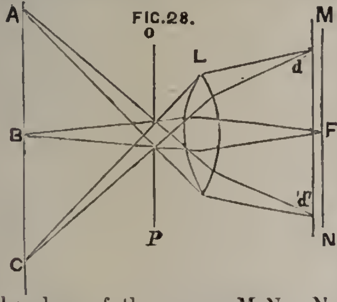
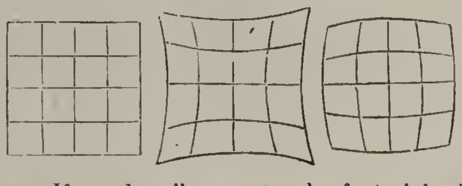


FIG. 28.



The next aberration which we have to deal with is the distortion. If we describe a network of straight lines, and hold a convex lens over it, placing the eye at a distance from it in the axis of the lens, only the two right angle lines of the centre appear straight: the others appear curved. When the upper is in the reverse position to the lower one, they appear pincushion-shaped. When distortion of the negative lens is reversed, the lines appear as the curved sides of a barrel.

Fig. 29.



The cause of distortion is somewhat difficult to explain, but the following figures make it clear. Let us describe upon a plate or plane surface a number of circles, A, B, C, equidistant from each other (Fig. 30 in front view, and Fig. 31 in profile), and place in front of them (Fig. 31) the lens L. Now the rays which proceed from A, B, C, parallel to the axis of the lens, strike it at *d*, *e*, *g*, from whence they will be refracted, and meet at *f*, the principal focus. If we place the eye at *f*, we see the circle A, not where it really is, but in the direction *f d*, the circle B in the direction *f e*, and the circle C in the direction *f g*. By prolonging the lines of directions until they meet the plane of the circles A B C, we observe that the circles do not appear equally apart. but their distance is increasing from C to A; they will appear as in Fig. 32.

FIG. 30.

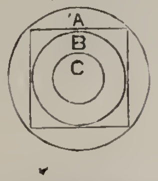
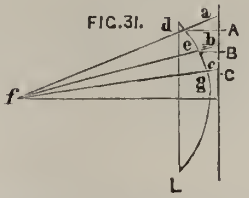


FIG. 31.



We will suppose for a moment that the circles A and B (Fig. 30), are of such relative diameters that a square inclosing B, with its sides tangential, shall have its corners in the circle A. Now if we draw the circle A and B (Fig. 32), as they will *appear* from *f*, the distance between A and B will be greater, or equal to *a b* (Fig. 31) and as the contact of the side of the square with B (tangentially), and with A at the ends, must be kept, the line of the side will now *appear* curved or bent (Fig. 32).

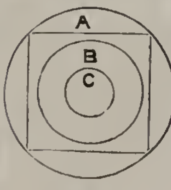


Fig. 32.

A single lens without distortion cannot be made, but by combining two or more lenses in connection with diaphragms in a certain position, the distortion may be corrected completely. If a diaphragm is placed in front of a lens, L (Fig. 33), different parts of the lens are employed to form different parts of the object, C D. In this case the distortion is barrel shaped; but by placing the diaphragm behind the lens, as in Fig. 34, the distortion is of the opposite nature, that is, pincushion-shaped. Rays coming from D (Fig. 33) pass through the upper part of the lens, while in the latter, through the lower part.

FIG. 33.

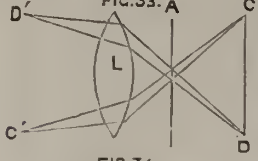


FIG. 34.

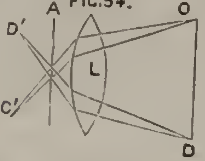
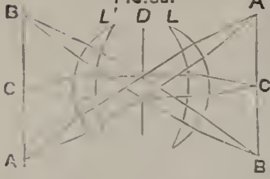


FIG. 35.



Now you will readily see that by uniting two lenses equal to each other, L, L′ (Fig. 35), and placing a diaphragm, D, between them, it follows that the distortion accompanying the lens L, with its diaphragm behind it, is corrected by the action of the same diaphragm upon the rays entering the lens L′, where the diaphragm is now in front of the lens L′. The modern photographic objectives to be used for architectural work and copying are constructed on this principle.

Unfortunately, this advantage is obtained at the sacrifice of aperture, that is, of light. I mentioned before, that the negative lens has the opposite distortion of the positive lens, so that by proper combination of lenses of suitable curves and material, distortion can nearly be overcome upon a limited field.

Photographic objectives used for portrait purposes, when a large quantity of light is desirable for brief exposure, are thus corrected; but these are again open to the fault of a restricted angle of vision. In all other lenses, when the light is the desirable element to be preserved, the correction of distortion must be made, as far as possible, by a combination of lenses.

To be continued.

PHOTO-MICROGRAPHY.

BY T. H. POWELL.*

A special photographic camera is not necessary, because in focussing, the body of the microscope is moved, and not the focussing glass. An ordinary camera, with lens removed, can, therefore, be used, with a piece of very finely ground glass, fitting the frame, carried by the dark slide, as a focussing glass, held tightly in its place by springs so arranged that the glass can be removed readily before the sensitized plate is taken out of the bath; it being most essential that the sensitized plate should lie in exactly the same plane as the focussing glass. Frames, measuring $4\frac{1}{4}$ by $3\frac{3}{4}$ inches, or 5 by 4 inches, will be found most handy, and should be well varnished, and great care taken to keep the wires clean. The microscope placed on a table, in a horizontal position, must be connected with the camera, a black velvet hood fitting round the tube of the microscope, and must be perfectly light-tight in every part. If the microscope be a binocular, the Wenham prism must be removed; and it is better to substitute for the eyepiece a brass tube, with a dead blacked interior extruding about a quarter of an inch from the end of the instrument over which stops of various sizes may be fitted (easily made from pill-box lids, by punching round holes in them). A paraffin lamp can be used for illumination, and admits of two arrangements. It can either be placed at the side, and its light condensed on the mirror beneath the stage by a bull's-eye condenser, and thence reflected through the object up the microscope tube; or the mirror can be dispensed with altogether, the lamp placed so that the centre of its flame is in a line with the optical axis of the microscope, and a bull's-eye condenser placed between it and the stage at that distance which yields an intense well-diffused light. If a transparent object (*e. g.*, the proboscis of a blow-fly) be now placed upon the stage, its reflected image will be seen upon the focussing glass; and this must be examined with a pocket lens, till, by means of the fine adjustment, the sharpest possible image is obtained. An allowance must now be made for the over-correction of the objective by turning the slow adjustment, so that the objective is slightly brought away from the object. For an inch object-glass about one-third of a turn is required; the exact fraction of a turn can only be ascertained by experiment. For a quarter-inch object-glass the correction required is so slight that it is scarcely necessary.

Everything is now ready for taking the negative. For this the following solutions will be required:—

A good bromo-iodized negative collodion.

Silver Bath.—Nitrate of silver, 1 ounce; distilled water, 14 ounces; nitrate of barium, 40 grains; dilute nitric acid sufficient to render very slightly acid. When all have dissolved, filter; and, before using the first time, leave a collodion-coated plate in it for half-an-hour.

Iron Developer.—Sulphate of iron, quarter of an ounce; water, 8 ounces; filter when dissolved, and add glacial acetic acid, quarter of an ounce; spirits of wine, three-quarters of an ounce.

Re-developer.—No. 1. Pyrogallic acid, 5 grains; citric acid, 12 grains; distilled water, 1 ounce. No. 2. Nitrate of silver, 10 grains; distilled water, 1 ounce.

Clearing Solution.—Cyanide of potassium, 80 to 120 grains; distilled water, 10 ounces. To be labelled "Poison."

The plate, having had its edges roughened by drawing across the edges of another plate, is rendered chemically clean by scouring with a mixture of tripoli powder one part, methylated spirit and liquor ammoniæ, of each two parts; then washed under a tap till all trace of the mixture is removed, drained, dried, and well polished with a silk handkerchief; next held horizontally, and the collodion poured slowly upon one corner, the plate slightly inclined so that the liquid spreads over its upper surface, and then tilted up so that the surplus collodion drains off again into the bottle. When the collodion has just ceased to drop, the plate is placed upon a dipper, and gently lowered without a pause into the nitrate of silver bath, moved up and down for a few seconds, then left at rest in the bath for about five minutes, when it may be carefully removed and stood on blotting-paper for half a minute to drain. From the time the plate is coated with collodion, till it is cleared, all operations except exposure must be carried on in a dark room. A bull's-eye lantern, with a piece of yellow glass substituted for the bull's-eye, should be used to light the operator.

The plate is next placed, film downwards, in the frame, and the dark slide-door fastened; then the dark slide is carried into the room where the microscope has been arranged, slid into the camera, and the shutter drawn up. The length of exposure varies, and can only be ascertained by experiment; as a guide, it may be roughly stated at from four to six minutes for an inch objective, with a circle on the focussing glass about three inches in diameter. With lower powers under the same conditions the time, of course, decreases. The time of exposure having elapsed, the dark slide is carried back into the dark room, the plate removed, held horizontally by a plateholder, and enough of the iron developer to flood it poured quickly on. The liquid, by a slight movement of the plate, being kept in constant motion backwards and forwards, the image will appear, and when its detail looks perfect, hold the plate under a tap, and allow a steady stream of water falling upon it to wash off all trace of the developer. Now hold the negative up to the light, and examine its back with a pocket lens. If sharp in every point, and no stains visible, the next step will be to intensify it.

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* Condensed from *Science Gossip.*

Equal parts of the re-developers, No. 2 and No. 1, are poured into separate glasses; the plate flooded by the latter, which is then poured off into the glass containing the former, and the mixed solutions poured back on the plate. After a few seconds the liquid is poured off again into the glass, and the negative examined. If the flame on the lantern can scarcely be seen through the blackest parts, the process must be stopped by washing thoroughly under the tap; but if this is not the case, the mixed re-developer must be again poured on; and this must be repeated till the negative is sufficiently black, care being taken, however, not to repeat this too often, or "fogging" will be the result.

It now only remains to remove the undecomposed bromo-iodide of silver from the film. This is done by pouring the cyanide solution—which can be used again and again—on the plate. When cleared, it is again put under the tap, thoroughly washed, set aside to drain, and when perfectly dry, gently and evenly warmed, a varnishing solution poured upon it just as described for the collodion; then, when the varnish ceases to drop, it is held before a fire till a bright and hard surface has formed. The negative is now finished and ready to print from.

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Recent Patents.

EMBOSSING THIN METAL SHEETS.

BY THOMAS A. DILLON.

This invention received provisional protection only.

This invention consists in embossing thin metal sheets with copies of manuscript writings, of engravings of printed matter, or pictorial subjects, by means of photography, whereby copies may be taken of such manuscript, printed, engraved, or pictorial subjects, either from the thin metal sheets themselves, or from moulds or castings taken from the embossed surface, back or front, as the case may be.

In order to carry out this invention I propose to photograph the subject to be copied in the ordinary way. Having procured a camera negative, I print a copy of it on prepared gelatine that is prepared with bichromate of potash or bichromate of ammonia, or such like chemical substance as may be best suited for rendering the gelatine surface where light acts insoluble. I then dry the gelatine surface according to any well known and convenient plan as used by previous experimenters. When dry and hard I lay the gelatine tissue or sheet on a hard metallic, even, clean surface; over it I lay the sheet of thin metal; over the latter I lay a sheet of lead, and I pass all three sheets through a copper plate or rolling press, or lithographer's press, when the copy of the gelatine surface will be found indented both into the brass and lead. Sometimes I use a sheet of prepared paper according to the method of the Ordnance Survey when adopting photo-zincographic copying. Having got the transfer on to the stone, or zinc, I dust fine resin on the greasy ink; I bite in sufficiently deep with acid to allow the letters or lines to stand up in relief. As soon as this is the case I lay thin metal covered with lead as before, and indent it by similar means. From the indented metal I can take copies in the way described in my patent, No. 1935, A.D. 1874, and I can cast stereotype plates, likewise, by covering them with thin paper and a thin coating of stereotype composition, now well known to stereotypists, such as a preparation of glue paste and whiting on paper.

A MANIPULATING CAMERA.

BY JEAN BAPTISTE DAVID.

The following specification describes a camera permitting the manipulation of plates without a dark room or tent:—

We know that it is necessary, according to the ordinary processes of photography, to make certain operations in a laboratory sheltered from all light, called camera obscura. No operation can then be made by the operator without his having close at hand a room or tent in which no light should penetrate, and in which he can move to submit the plate or negative to the different preparatory rinsing and fixing baths which are necessary to its treatment.

By means of my process, the operator no longer requires that appendage, so inconvenient, especially when the operation does not take place in the so-called studio; indeed, the photographic apparatus of my invention carries with itself its camera obscura or laboratory, and the operator can prepare, rinse, and fix on the spot and before the object to be reproduced, the negative, which is sheltered from all light, although he himself should be in broad daylight. Hence it follows that, even under the least favourable circumstances, it will be possible, by the ordinary photographic process, to take views which have not hitherto been taken for want of installation of an ordinary camera obscura or laboratory.

My camera obscura or laboratory consists of a fixed box placed under the ordinary photographic apparatus, the capacity of which does not surpass that of the said apparatus. In this box is to be found another made of tin, without a cover, which can be taken out on one side of the exterior box, the side serving as a little door. In the tin box are three gutta percha bowls, separated from each other by a partition, and in each of which the plate or negative can be immersed in the manner that I am going to describe, to be submitted to the baths necessary to its treatment. The first of these bowls contains the bath of nitrate of silver. The second bowl has two compartments; in one of them is the bath of sulphate of iron, in the other a water bath. The other bowl has also two compartments, which contain the bath of hyposulphite and a second water bath.

To accomplish these immersions in the conditions of installation which has just been described, it is necessary (1) that the so-called photographic apparatus, the camera obscura or laboratory, being fixed, may be able to move so as to carry the negative or plate on a vertical level with each of the bowls. This way of moving is given to the photographic apparatus by means of two racks, used, so to say, as guiding rails, and having catches at the different places where the apparatus is to stop; to obtain this it is only necessary to push the apparatus which moves upon small pulleys; (2), that the negative or plate may be, at the operator's will, dipped in and taken out of the different baths, passing through an opening made in the bottom of the photographic apparatus; this exists, in fact a trap is to be found beneath the plate or negative in the bottom of the apparatus; the plate or negative can move downwards or upwards according to necessity, by means of nippers, between the jaws of which its upper edge is clasped, and it can slide in vertical grooves inside the photographic apparatus at the operator's will, for the branches of the nippers unite at the upper end, and form a handle, which is within the reach of the operator's hand, above the apparatus; thus the operator can push or pull it when necessary, to dip in or take out of the desired bowl, the plate or negative; the handle is of a sufficient length to let the plate go to the bottom of the bowl, so that when the plate or negative is on the same level with the lens of the apparatus, the handle of the nippers is nearly quite outside the upper part of the said apparatus, whereas, when the plate or negative is down, the handle disappears almost entirely; a little screw keeps the handle up when necessary. The nippers, of course, by their handle, can be taken out through the upper part of the apparatus when the collodion is to be applied in the open air. The other operations are made in the usual way; however, as it is sometimes necessary to judge, by looking at the negative, whether or not it must be taken out of a bath, a little yellow glass opening is made both in the cover of the lens and in the framework. This little aperture, being opened an instant, allows the image formed upon the negative to be seen by a ray of light going through the apparatus.

The bowls may be filled up with their respective liquids from any vessel whatever, but to have the apparatus supplied with all that is necessary, the liquids are placed in recipients communicating with the bowls by means ot india-rubber tubes provided with taps. These recipients are placed in a separate compartment at the bottom of the camera obscura or laboratory. To fill up the bowls the recipients are taken out, raised with the hands above the level of the bowls, when the taps are turned on. To empty the bowls it is only necessary to replace the recipients.

The constitutive element of the invention of this apparatus consists in the whole of these constructions and arrangements by means of which the photographer can operate everywhere, having close at hand all that is necessary in a very limited space.

The Photographic News.

Vol XX. No. 937.—AUGUST 18, 1876.

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WARNERKE'S TISSUE AND ROLLER DARK SLIDE.

THE Warnerke film and roller dark slide bids fair to create somewhat of a revolution among dry plate workers. For amateurs and tourists the apparatus seems particularly appropriate, and those who have seen clichés produced from the sensitive tissue will agree that they are quite equal to pictures secured with the best dry plates. In another column we publish a letter from Mr. Baden Pritchard, who is well known to most of our readers as the director of the War Department Photographic Establishment, and this gentleman bears valuable testimony to the excellence of the Warnerke film. Mr. Pritchard thinks that our readers will like to know how he has succeeded with the apparatus which he took with him on a pedestrian tour into the Tyrol, and his letter forms a suitable postscript to the communications with which he favoured us from abroad. We need not recapitulate the route taken by Mr. Pritchard, but it is sufficient to say that during his holiday he undertook a good deal of mountain climbing, and was able to carry his little apparatus with him wherever he went—a good proof, we should think, of its lightness and portability.

Mr. Pritchard tells us he is more than satisfied with the results he has obtained: he is delighted. And he certainly has good reason to be, if he secures two dozen such nice little pictures as he has sent us as the first-fruits of his moderate exertions. Most of our readers have seen pictures printed from the Warnerke film, and those now before us are, as Mr. Pritchard says, "quite free from pinholes, and as harmonious and full of detail as wet plates."

The tissue, it seems, was received from M. Warnerke at the end of June, and is now being developed about six weeks afterwards; as no remark is made about the development, we suppose that it has not suffered in any way from the time that has elapsed. Certainly there are no signs of deterioration in the prints before us. We see, however, that full exposure was given, Mr. Pritchard telling us that "the exposure on an average was about one minute with fair light and medium stop, the lens being Dallmeyer's 1A Rectilinear." M. Warnerke, like most dry plate workers, advocates giving long exposures; if a minute will give a good picture with a dry plate, fifteen will do no positive injury if the film is afterwards carefully developed, while an under-exposed dry plate can never be worked up quite satisfactorily. No doubt Mr. Pritchard's experience dictated to him a full exposure, otherwise thirty seconds would have sufficed under the conditions specified.

We can well understand how Mr. Pritchard has sometimes failed to get sharp images. As our readers know, the roller dark slide of M. Warnerke consists of an endless band of tissue that is made to pass from one roller to another as portion after portion is exposed. The tissue passes in front of a thin board, and it should be stretched quite tight in front of this board during exposure. Two clamps opposite to the roller buttons serve to fix the tissue firmly in this position, and so long as these clamps are firm the tissue lies perfectly flat. Mr. Pritchard, however, instead of shifting his tissue the moment before it entered the camera, did so some time previously, and in a few cases the tissue had become slack, and unsharp pictures were necessarily the result. Such a defect as he points out could always be avoided by putting the tissue at tension just before the exposure is made.

We have had an opportunity of viewing the series of whole-plate pictures taken by M. Warnerke in Belgium, and they certainly furnish, together with Mr. Pritchard's experiences, abundant proof of the intrinsic merits of M. Warnerke's tissue and his roller dark slide apparatus. To those who are practising carbon printing by single transfer we would warmly recommend the employment of M. Warnerke's tissue, because the film clichés produced are so admirably adapted for printing purposes, and altogether for keeping purposes his delicate but strong negatives are exceedingly convenient.

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FAULTY PHOTOGRAPHY.

Nascitur non fit, seems applicable to photographers, if we are to judge from many things we see and hear. Some men may devote themselves to the art for a score of years together, and never learn how to handle a plate properly, while there are others who get successful results after scarce a month's practice. And it is not always the "court photographer," as our German cousins waggishly call the humble individual who practises portraiture in black and white up court or alley, who is at fault with his manipulations. We have seen men of pretensions coat a plate with hands which would be considered dirty at hoeing potatoes, and afterwards fish it up out of the silver bath with the same useful digits. Others, again, look upon photographic manipulation in the same light as shelling walnuts, and, as a matter of course, get their hands equally stained over the business. They can't make it out why all their sitters should appear like saints with a halo round their heads, and why strange astronomical phenomena are to be seen all over the film. Yellow stains upon their prints is the normal condition of things, but then "it is such a bother, you know, always to keep on washing your hands;" and consequently the fingers that have just grasped a handful of hypo crystals from the cask are stretched out to receive the washed prints to spread them out to dry.

As we say, it is not to the cheap operator that these "atrocities" are confined, as a case which came to our knowledge the other day fully demonstrated. A gentleman, well established in business, who receives guinea orders by the hatful, recently had occasion to do some outdoor photography at a fête. Why bother with wet plates and a tent, thought he, if the work could be done by some dry process? and that dry processes were capable of wonders was certain from what he read every day in the journals. He selected his process accordingly, received from a gentleman some plates ready prepared, and set out rejoicing to do his first day's work with dry plates. Judge of his horror when, returning home the same evening to develop the pictures, he found them one and all failures! The day's work and the chance of untold orders were gone for ever.

You may be sure that the gentleman whose process he had used received early news of the result, and without more ado the former started off to the studio where dwelt the unlucky victim. The plates were dragged out and shown one after another—all fogged, nothing but blurred undefined images. "I'll never try a dry process again as long as I live," was the enraged photographer's cry as the inventor critically examined the films again and again.

"Where is the camera that you used?" asked the latter, apologetically.

"Oh, there's nothing wrong with the camera! don't think it; there's the camera, and there's the dark slide."

But the photographer did not bring them forward very cheerfully, and when the dark slide was examined, lo, and behold! a rent was visible in the back, which was altogether in a very shaky condition. As the dry plate worker looked at it doubtfully in silence, the photographer took it pettishly from his hands, and slipped it into the camera.

"There, that's right enough if you only hold your hand there."

"But the camera itself is not very steady, so far as I can see."

"Well, you can put your other hand here to steady it, can't you? However, that has nothing to do with your plates. I have taken plenty of good pictures with this same camera and slide."

The photographer was quite right. When the rent in the dark slide was held-to with the fingers, and the camera was steadied also by lending a hand, there was nothing amiss to account for the abject failure of the plates, and the cause was to be looked for elsewhere.

"How did you change your plates?" was the next question.

"In the darkest place that could be found," replied the photographer promptly. "My lad changed them."

"Can I see the boy?"

"Certainly."

The boy was sent for, and arrived quite in a fluster to tell the truth and to bear out his master's views.

"So you changed the plates in the dark, did you?" the lad was asked.

"Yes, in the very darkest place that I could find."

"And where was that?"

"In the lodge," was the prompt reply.

"Yes, but whereabouts in the lodge?"

"Oh! not in the front room; it was much too light. I went into the bedroom at the back and pulled down the blinds. It was so dark that I could hardly see what I was doing."

This was the whole story. We have told it without any exaggeration, although we have altered a few of the details. The *denoument* has not been retouched in the least.

◆

PHOTOGRAPHIC BACKGROUNDS.

M. Hans Hartmann, who was for many years the Secretary of the Berlin Society for the Advancement of Photography, and who for a long time past has filled the position of chief photographer to the well-known firm of Loescher and Petsch of Berlin, contributes to the *Mittheilungen* a most practical paper upon photographic backgrounds. M. Hartmann is not new to photographic literature, for, besides other papers, a clever little pamphlet on "Treatment of Sitters" may still be remembered by our readers. M. Hartmann therefore writes as a photographer who has experience of the public and of the studio; his work, as presented to us in the form of Loescher and Petsch's charming studies, is almost as well known in this country as abroad, while his training as an artist and as a scene painter renders him specially qualified to write upon the subject of photographic backgrounds. For this reason we have taken care to translate M. Hartmann's article without curtailing or abridging it in any way:—

"Many inquiries have reached me from photographers as to the best manner of preparing photographic backgrounds and painting furniture and properties for the studio, and in reply to these I have now written down such experiences of my own as I have gathered as scenic artist at the Berlin Theatres Royal and as a practical photographer. Although I do not believe that any one after reading what I have written will be in a position at once to produce serviceable backgrounds with the brush, still many of my colleagues are so skilled with the pencil and the retouching brush, and are so well acquainted with the canons of art, that they will be able, I hope, to derive some assistance from these lines, and with the aid of an ordinary painter to alter or modify any scenic effects that they may possess, so as to render them serviceable to their purpose with no very great difficulty. The necessity of employing surroundings in harmony with the sitter is so very obvious that nothing need be urged upon this subject.

"For the basis of a background it is best to employ frames such as painters use for their pictures. These should be fitted with stretching wedges, and the woodwork must be strong enough to resist warping when covered thickly with paper. For a size eight-foot square, a three-quarter or inch board, three and a-half to four inches broad, should suffice. The frame should be hung easily on a roller that runs upon a rail, so that it can be moved without difficulty. An arrangement by means of which the frame can be turned to and from the light is very advantageous, for in that case the same background will do for dark and light figures, its nature being altered according as the light is allowed to shine upon it. A method of shading the background by means of furniture, blinds, &c., such as has often been proposed in this journal, cannot be too strongly recommended.

"The materials which are the easiest to paint are paper and coarse canvas (shirting, twill, &c.) Shirting is generally sold glazed and dressed. It is fastened by means of nails, driven in only half-way, and after it has received its preliminary coating (of which more anon) it is carefully examined to see if there are any signs of contraction. If this has not taken place sufficiently, which is very often the case with shirting that is dressed hot, a few of the nails are withdrawn, and while the material is still drying it is stretched anew. Twill and linen are better in this respect, and by reason of their roughness can be painted upon more easily; but then, on the other hand, they are heavy. If it is desired to put paper upon linen, it is well not to paste the same at the corners, but keep an inch from the margin all round. In this way you prevent the crooked contractions which otherwise arise over the surface. Most excellent backgrounds may be produced by anyone if he will only paste upon his frame some tasteful paper-hanging in which the colours are not too glaring, putting over it, so as to reach about knee-high, paper of a brownish tint, the division or panel being marked by a double or treble line with the aid of a brush. The ground may afterwards be divided into squares or right-angled forms, and these fields then ornamented with paintings of some kind or another.

"I come now to the colours which are most easy of application, and which may be depended upon in photography not to come out different to what they appear to the eye. For distemper, chalk (levigated), light ochre, umber, and cassel brown, are most suitable.

"The chalk must be softened in cold water before being mixed with the lime, as also ochre and umber, the latter, because of its tendency to swell, being allowed to remain immersed for a longer time. Cassel brown is purchased already ground in water, and is kept in a pan under water. If it is once allowed to dry, it becomes stony and insoluble, and consequently altogether useless. When mixed with chalk it gives the most beautiful warm grey tones, and consequently I employ it very frequently. Well mixed with the chalk and glue solution, it is easily and uniformly applied. To modify the tint, English red, chrome green, or any kind of blue may be employed.

"As binding material for the colours, I employ a ten-per-cent. solution of glue, luke-warm, or a good freshly-made starch paste. The quantity of glue or size cannot be accurately defined, but must be settled by experiment; but the character of the preliminary ground has a good deal to do with the amount of glue to be employed. A thin solution should be taken first and mixed thoroughly with the colours ground in water (this is best done with the aid of a pestle and mortar), and then a trial should be made with the same brush and upon the same canvas which are hereafter to be used. Three applications should be made, one with a full brush, one with a moderate amount of colour, and a third with the brush nearly dry, when the latter is employed with considerable energy. If there is too little glue, the colour dusts off in the case of the dry application when rubbed with the hand; if there is too much, spots will be observed, and then more colour and water must be added, and a second trial made. When the mixture is right, the surface will be even and uniform. The proper degree of thickness is soon found in working; the addition of water does little harm, especially when this is luke-warm.

"The colour is applied with the brush in an even manner, care being taken not to come upon half-dry places, as spots and patches are sure to be produced. If on the first trial it is found that the colour sinks into the stuff too much, as is always the case with stout linen, it is necessary to give a preliminary coating of chalk and strong glue-water, the same being filtered first of all to ensure a very clean surface. This coating must be allowed to get perfectly dry before you proceed to colour the background. If there has been much glue applied to it, it becomes hard and smooth; if it has received but little, it will absorb more hereafter, and then the colour should contain more glue. To secure a fine ground, the canvas, after the preliminary coating has dried, may be rubbed with pumice to remove any loose fibres, and, after it is thoroughly dry, it may be uniformly coated with soft soap and water; in this way the most uniform tints may be secured." (*To be concluded.*)

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PHOTOGRAPHIC STUDIOS IN MELBOURNE.

[For the following amusing sketch of two studios in Melbourne, which appeared in the *Melbourne Herald* under the heading "Two Extremes," we are indebted to an Australian correspondent.]

It is very questionable, to my mind, whether Daguerre, Talbot, and Fox, conferred a benefit on the human species when their several efforts produced photography, or whether they were not agents of his Satanic Majesty, for disseminating a new curse. It's a moot point, of course, but I incline to the latter opinion. To begin with, it is not even decided whether photography is an art or a trade—though unquestionably it is a serious mystery to some; whether its professors should be ranked with the R.A.'s, or relegated to a position among grocers and brokers and candlestick-makers. In the next, it is a matter of opinion whether dentistry or photography causes most suffering to the subject. Under these circumstances, I have determined to abandon my original intention of calling this sketch, "High and Low Art." If I did adhere to it, it is within the bounds of possibility that Mr. Chester Earles and the rest of the V.R.A.'s might indignantly protest against the prostitution of the word; and, of course, the photographers themselves would object to the title of "Two of a Trade." I have resisted the temptation of making allusion to "this picture and that," and content myself with selecting the above vague and inoffensive head line. But, of course, I do not abandon my purpose, which is to give a type-sketch of two photographic galleries or studios, or whatever the owners thereof may choose to call them. Suppose we begin with the highest representatives of the profession (I'm safe there, I think), and then proceed to the lower.

Within sound—very much within sound—of the post-office clock, is the establishment I refer to. Outside is a case, where the cabinet portraits of a number of "sky pilots" are displayed. I won't stop to comment on their appearance, though a few do invite remark from the sheer inconsistency of their faces and their profession. In the entrance passage are a series of highly-finished sepia portraits of celebrities, including a Royal Highness and a dissenting minister, and a diploma appointing the firm photographers to the Royal Highness aforesaid. A somewhat inconvenient flight of stairs leads to a well-carpeted anteroom, where a few cases, containing cartes-de-visite, are hung. Nearly opposite the entrance is a *comptoir*, at which presides a lady, posed in a fascinating photographic attitude, and who changes from one pose to another equally adapted to the requirements of the camera, with a facility rather startling to the unaccustomed visitor. Blandly she requests you, on learning your business, to step into the adjoining room, separated only by wide hung curtains. Here another series of pictures, only a few of which are photographs pure and simple, are arranged for inspection. The majority of these are, in point of fact, highly finished water colour portraits. Pretty women and handsome men, chiefly all well dressed, and posed as artistically as the inherent awkwardness of the commonplace British or colonial subject will permit of; some few in fancy dress, or uniform, vary the monotony of the fashionable absurdities in the way of chignons and plaits, paniers and dress coats. One lady in deep mourning, having a really lovely, but intensely melancholy, face, rather startles one's notions of propriety by holding a particularly small and delicate trifle in the way of the lately fashioned bonnets in her hand instead of on her head, while the background is a monotone of grey, evidently intended for a cemetery, as there is a memorial cross at which one may suppose the lovely and melancholy lady has been weeping. A portrait of a deceased actress, whose face, without being regularly beautiful, was wonderfully fascinating, recals sad memories of a wasted life and lost talent; and a dimpled darling of a child, curled up more naturally, and consequently picturesquely, than artistically, sets one wondering as to the possible future of such a bright and promiseful present.

Before one has thoroughly exhausted the exhibits in this room, one or more parties of ladies and gentlemen are ushered in, and commence a tour of inspection. "Oh, here's So-and-so!" and "Look at Captain Chose—do you think it's like?" and "Fancy Miss Thingamy in that dress—isn't she flattered?" are the kinds of exclamations and remarks that follow. One is relieved from this infliction by the lady of the *posee*, who sails in, managing her very long train with a grace an actress might envy, and who apologises for the delay, "We are so busy, you know, and it is usual to make a previous appointment; but if you will walk into our picture gallery, I venture to think you will not find the time heavy." We follow the train, and, crossing the ante-room, find ourselves in a well-lighted but somewhat diminutive picture gallery, whose walls are closely hung with paintings in water and oils. Most of them are mediocre, a few are good, none very superior. But a moderate price only is demanded, and there is an opportunity for rising talent to exhibit itself and find a market.

Half-an-hour passes before the signal for execution—I beg pardon, the sitting—is given, and then a bright-faced girl, who has not arrived at the dignity of a train, or the studied grace of the lady who poses, directs the attention to a still more awkward and breakneck staircase. We ascend without a catastrophe, and find diminutive dressing rooms, with gigantic glasses, toilet requisites, including *powder des perles*, or something like it, and more pictures—one or two rather French in their display of boots and stockings.

Last scene of all—the studio. Backgrounds and curtains, pedestals and other properties, such as pianos, balustrades, bookcases, which form the usual accessories to photographic pictures. Operator makes his appearance: a particularly handsome man, in a faultless frock coat, whose hands betray no trace of the black art. In a pleasant voice, he inquires the style of portrait you require, hazards a remark as to the weather, suggests that you take a seat comfortably, and then proceeds, in the most delicate way, to examine your points. It is a mental process, of course; but none the less evident is the progress of his consideration. "Ah! profile no good—full face—ah! yes, no help for it—figure good—yes—will recommend a full-length instead of vignette—show to greater advantage." And the result is as the operator desires, and a full-length caste is substituted for the vignette. Operation proceeds—blinds are drawn and redrawn, to obtain the requisite effect of light and shade, and finally you are semi-jocosely requested "not to look too severe." Of course the inevitable grin overspreads your face. Operator waits till it subsides into a simpering smile, and then says, "Now steady, for just one moment, please." He puts a cap over the lens, bows a "thank you," disappears into a small closet, reappears, thinks he has a very satisfactory negative, but will try another to give you a chance, and repeats the process. He again dismisses you with the grace of a Grandison, and you find youself by the *comptoir* again. The lady with the train asks your name and address. "Shall she send you the proofs, or will you call to see them?" You will do yourself the pleasure of calling. You mildly ask the price per dozen, and are informed, "One pound per dozen plain, and two shillings and sixpence each extra for tinting." You acquiesce in the suggestion that half shall be plain—you feel that is inevitable under any circumstances—and the other half tinted, and trust to providence and aniline colours that your own mother may recognize the likeness.

The other establishment is situate near the hospital. Outside are painted canvas signs, of the Richardson show style, announcing that portraits can be taken, in all weathers, from sixpence each, and cartes-de-visite at five shillings per dozen. At the door, and in the window, are a miscellaneous collection of very shady looking portraits, chiefly of boots, elbows, and knuckles. Any idea of profile or three-quarter face seems to be unknown to the individual who has posed the unhappy subjects, whose full faces are, as I said, quite subservient to their boots and their knuckles. On entering, more canvas signs, a few more cartes and portraits are visible. A counter, scrubbed till it looks like a dairy-board, separates the visitor from a female form, which might, possibly, have been graceful in infancy, but which years and eighteenpenny corsets have long deprived of any attribute of the kind. Her hands are blackened with nitrate of silver, and her face puckered by constant terror of the cyanide of potassium and other deadly chemicals one daily sees and handles. She holds a portrait in her hand, the back of which she covers with a black varnish, that adds another stain to her already begrimed fingers. She looks up, but says nothing until she has put the finished picture into its frame, when she turns, and "Want yer picture taken?" is her inquiry. The affirmative produces no variation in feature, no modulation of tone, but an abrupt request to "Go in there." "In there," means behind one of the painted canvas signs alluded to, when one finds a small—well, I suppose one must say—room, in which a rough deal bench forms the sole furniture. A minute or two passes, and, before one gets accustomed to the semi-darkness, the operator enters from another mysteriously shrouded doorway. This gentleman scorns the modern civilization of a coat, and delights in shirt sleeves, a very voluminous Rob Roy scarf, a cap of nondescript shape, canvas shoes, and spectacles. He demands, as the female has done before, "Want yer portrait taken?" and immediately shows, in evidence of his skill and his extensive business, three shadowy negatives of "these 'ere young women"—he indicates the subjects by a jerk of his head. He then ushers the next intended victim into the place of torture. This appears to combine what is familiarly known as the "dark room," the kitchen of the family, the dressing-room of the patients, and the actual operating room, under one roof. Judging from appearances, one would not be far wrong in asserting that the premises had been abandoned as a stable, and, by the aid of a few sheets of glass, and a mysterious arrangement of curtains, adapted to its present purpose. The camera consists of some deal boards roughly screwed together. The stand was equally rough, battens held together by a few nails. Of course there were the inevitable properties in the shape of a balustrade and pedestal, without which even the humblest photographer could not get on. After a brief disappearance the operator returns, and curtly suggests that you "had better sit down." A "Now, then, Jack!" calls a remarkably greasy boy into light, who immediately makes a precipitate dive to the back of your head. He forces your unwilling cranium between a sort of vice, and then darts away; seizes about a yard of background, painted to resemble the "'alls of hancestors;" balances it at your back in so precarious a manner that you feel convinced it will overwhelm you ere you are released. The young boy then takes up position in front of you, thrusts his hands far down in his trousers pockets, eyes you critically, ejaculates that "it'll do," bids you "not move, or yer'll pitch it out of focus;" and then, still surveying you with a semi-warning and semi-approbatory air, proceeds to whistle at the top of a very shrill voice. The man with the scarf and the spectacles now says, "Keep yerself steady, and don't breathe too hard;" and, after a few more moments of purgatory, you are released. The portrait is handed over to the amorphous woman, who immediately puts it in the flame of a primitive spirit lamp, applies the black varnish, encloses it in a small gilt mat or frame, and demands sixpence. Possibly the unhappy woman has been "done" by some conscienceless customer, for she keeps a tight hold on the portrait until the money is safely in her hand. With difficulty she extracts the change from a meagre-looking purse, and hands it, without thanks, or the faintest mobility of feature. An examination of the result is not flattering to one's vanity. Possibly one has imagined oneself to be, at least, well-bred in appearance. The portrait has a decidedly vulgar look. A patch of black gives the effect of a turn-up nose, and a spot of white in the eye suggests a wall eye. With an apology for troubling, I went again to the operating room. A young person, evidently a respectable servant-girl, was on the stool of repentance. She mildly suggested that she would keep her hat on. "Oh, please yerself; only don't say I didn't tell yer. Yer won't be able to see no hies. But I don't care so long as yer stick to yer bargain." Thinking I had been martyrised sufficiently in the pursuit of knowledge under these difficulties, I made my escape, meeting on my way out several other victims, who were about to immolate themselves on the sixpenny altar of vanity.

THE REPUTED PRESERVATIVE ACTION OF OIL OF LEMON.

BY FRITZ HAUCK.*

I have lately tested the method which was proposed some time ago by Mr. Devey, an American photographer, to preserve sensitized silver paper in a white condition by means of essence of lemon vapour, and although my investigation has been conducted with the utmost care, I must say that I have obtained results widely different from those secured by M. Fleury Hermagis, whose experience confirmed that of the American photographer.

I took two boxes, and in one of them I placed, according to directions given by Fleury Hermagis, a wire net, and two tufts of cotton wool lightly impregnated with oil of lemon Upon the net-work were placed several sheets of albumenized paper that had been sensitized, and the box was then closed with a well-fitting lid. Into the other box I also put several sheets of paper, but no oil of lemon, and the case was then closed like the other.

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* *Photographische Correspondenz.*

After the lapse of four days the sheets of paper in the second box were still beautifully white, while those in the box containing the oil of lemon vapour began to colour a deep brown. This tinting showed itself first of all on the borders of the paper, where the silver solution had dropped off, and then in those parts which were directly over the tufts of cotton wool.

After another interval of five days the sheets in the other box began to grow brown also, but they were still serviceable; while the paper in the vapour box, on the other hand, had, in the interior, become so bad that it was altogether useless.

What was the reason of my obtaining such results I know not; so much is, however, certain, that the preserving method is one which cannot be described as faultless.

CUTTING AND ENGRAVING GLASS.*

The art of cutting and engraving glass is supposed to date from about 1609, at which time Caspar Lehmann, then in the employ of the Emperor Rodolphus II. as a cutter of iron and steel, obtained from the Emperor the exclusive right to cut glass, and he also received the appointment of glass-cutter and lapidary to the court. Prior to that date engraving on glass consisted of a few scratches made with a diamond; and for works of this description the Venetians of the sixteenth century enjoyed a high reputation throughout Europe. It was long after the period above named that the art assumed the important position it has since obtained. Nuremberg, the city of the arts, excelled in glass-cutting during the middle ages, and great taste and ingenuity are often displayed by the artists of the present day in the form and embellishment of the various articles of this description that come from their hands.

The implements employed by the glass-cutter, although, owing to the great variety of the work he has to execute, they are of necessity numerous, yet partake of the simplicity observable throughout the various processes of the manufacture. In every establishment a shaft causes the revolution of numerous large wheels or drums fixed thereto, and each of these, connected by a band with a pulley on the axle of a small wheel, occasions the latter to revolve with great celerity. These small wheels are the cutting instruments. They are all so arranged that any one can be unfixed and another substituted in its place without difficulty. As regards their form, they are either narrow or broad, flat-edged, mitre-edged—that is, with two faces, forming a sharp angle at the point of meeting—convex or concave; and of these different wheels a great number are always to be found in the workshop of the glass-cutter.

The materials employed in the formation of these cutting implements are, iron (both cast and wrought), stone, and willow wood. Wrought iron is only used for cutters of the narrowest dimensions, which it would not be possible to make sufficiently tough of cast metal. Iron wheels are only used for the first or roughest part of the operation, and their employment is dispensed with altogether where it is intended that the pattern shall be at all minute, as the metal and the sand which must be used in connection with it would act too roughly, and frequently portions of the glass would be chipped away. For such minute work a fine-grained stone, moistened with water, must be used. The further smoothing and subsequent polishing of the cut surface are effected with wooden wheels; for the first of these objects the edge is dressed with either pumice-stone or rotten-stone, and for imparting the highest degree of polish that is required for properly finishing the process putty powder is employed.

Beneath each one of the cutting wheels a small cistern is fixed to receive the sand, water, or powder, which has been used; and over the wheel a small keg or a conical vessel is placed, the cock or opening at the bottom of which is so situated and regulated that the requisite quantity of moisture will be imparted from it to the wheel. The vessel, which is placed over the iron wheel, is furnished with fine sand, and into this water is admitted in such quantities as will insure the constant delivery of the moistened sand upon the face of the wheel, in such proportions as the workman finds most desirable. The emery powder, rotten-stone, or putty powder, are applied from time to time, as required by the workman, on the edge of the smoothing or polishing wheel.

The grinder seats himself on a stool in front of his wheel, and taking in his hand the glass to be ornamented, applies this to the face of the cutter, calling into requisition the steadiness of his hand and the correctness of his eye in the successive applications to the wheel of those parts which are to be cut. Placed at his right hand, each workman has a small tub containing water, which he uses from time to time to wash away the particles of sand or powder which may adhere to the glass, that he may the better judge as to the progress of his work.

The grinding of glass, or frosting it, is usually applied to the inner surface of globes and shades of lamps, and to effect this the article is fixed in a lathe, and the workman, holding in his hand a piece of wood which is covered with wet sand, causes this to rub with the necessary degree of force against the inner surface during the rapid revolution of the glass.

Ornamental figures placed on articles of glassware are produced by compressing a portion of glass in a mould, and then they are attached to the article. These designs are usually raised, and they have an advantage over engraving by retaining a polish; but the edges are not so clear and sharp as when cut by the wheel; and there is another objection—figures on glass ought to be treated in intaglio, and not in relief.

Another method of engraving is to employ fluoric acid to bite away a portion of the surface of the glass, leaving the figure in intaglio. For this purpose the whole surface, with the exception of that taken up by the design, is covered with a varnish, either a solution of isinglass, or turpentine varnish mixed with a small proportion of white lead, and the acid is then applied to the exposed parts, which it gradually eats away till the required depth is obtained. If the figure is to be left in relief, then the design is traced with the varnish, and the rest of the vessel's surface is subjected to the action of the acid. By this means the figures are left in relief with their original polish.

In the six hundred and twenty-fifth part of an inch the following words have been engraved upon glass, "Lowell & Senter, watchmakers, 60, Exchange Street, Portland. Written by Fremont, at Paris, 1852." This is equal to forty-six thousand eight hundred and seventy-five letters in the circle, of an inch in diameter. The most powerful magnifying glass reveals only a few apparent scratches; but with a microscope of great power the inscription can be plainly read. The body of an ordinary pin, placed between the inscription and the microscope, completely covered the inscription, the circle in which it is inscribed being smaller than the head of a common pin.

But even this has been surpassed—the Lord's Prayer having been executed within the same compass; and within the one-hundredth part of a square inch—that is, the fiftieth of an inch in length, and the two-hundredth of an inch in width—the following lines have been engraved:—

"A point within an epigram to find,
In vain you often try:
But here an epigram within a point
You plainly may descry."

The process of engraving consists of a mechanism by which the point of the graver or stile is guided by a system of levers, which are capable of imparting to it three motions in right lines, which are reciprocally perpendicular, two of them being parallel, and the third at right angles to the surface on which the characters or designs are written or engraved.

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* From an excellent technical journal, entitled *The Furniture Gazette.*

Etching on crown glass is a very simple process. The glass is first heated in a sand bath, and then rubbed over with purified beeswax, the temperature of the glass being such as to cause the wax to melt completely and uniformly over its surface. When every part of the plate is covered with wax, it may be set aside to cool. A paper having a design boldly drawn upon it may then be attached to the unwaxed side of the glass, and the workman traces the lines through the wax by a pointed instrument, care being had that the point clears all the wax from the glass wherever the design comes.

This done, some coarsely-powdered fluorspar must be placed in a vessel, together with a quantity of sulphuric acid, well mixed together, and as soon as they are incorporated, the glass should be placed over the vessel, the wax surface downward, when a moderate degree of heat must be applied to the bottom of the vessel. The fumes of fluoric acid soon arise and attack the surface of the unprotected portion of the glass. In half-an-hour it may be removed, washed, and the wax scraped off, leaving the design perfectly etched upon the surface of the glass.

Correspondence.

THE WARNERKE FILM.

Dear Sir,—Some of your readers may like to know of the results I have obtained with the little Warnerke apparatus which I took with me to the Tyrol this year. The roller slide was made to hold enough tissue for forty pictures, but some portion of it I exposed and developed before starting, so that enough for thirty-three plates only remained for use. I had a reserve roll of tissue, but this I left behind when I began my knapsack tour, as I knew I had quite sufficient for my purpose.

I received my tissue from M. Warnerke during the latter end of June, and I have still a few films yet to develop. So far, however, I have every reason to be satisfied, and I enclose you half a dozen pictures for your inspection, which alone I consider repay me for the little trouble I have experienced. Only a fifth of the films that I have developed so far have failed, and this for the simple reason only that the image has not been sharply focussed. Not a fragment of the tissue seems to have failed through insensitiveness, or from spots or patches upon its surface. As you will see from the pictures I send, these are quite free from pinholes, and are as harmonious and full of detail as wet plates. The exposure given on an average was about one minute with fair light and medium stop, the lens being Dallmeyer's 1A Rectilinear. I shall have pleasure in showing you the remainder when developed.

So far as I myself am concerned, I am delighted with the results, for I have already a larger number of successful plates than I have been able to secure before with dry plates during my summer tours, while in the present case I have been free from almost all the trouble and incumbrances that beset the dry plate worker. Indeed so little was there to do, that I grew quite ashamed of myself "potting" pictures in this easy fashion.

What failures I have sustained are, I must acknowledge, due entirely to myself. At starting, I deliberated whether I should turn the rollers of the dark slide immediately after making an exposure, or before conducting such operation. In order to make quite sure of not exposing the same piece of tissue twice over, I decided, in an unfortunate moment, to work my rollers immediately after every exposure, and to this I attribute the circumstance of a plate now and then not being sharply focussed. Tramping for an hour or two afterwards had no doubt a tendency to loosen the clamps, and hence on some occasions the tissue was *slack* instead of *taut* when exposed. Had I invariably tightened my screws just before exposing I should never, in all probability, have had an unsharp picture.

To prove how successfully the roller slide may be worked, M. Warnerke has just shown me the results of a forty-length roll of tissue that he has exposed during the past month in a tour through Belgium. He has thirty-seven charming pictures; two views were not successful because he omitted to take the cap off his lens, and one image of an interior was under-exposed after the camera had been standing upwards three hours.

Out of my thirty-three exposures I anticipate above two dozen of successful pictures.—Faithfully yours,

H. Baden Pritchard.

War Department, Woolwich, August 15th.

THE EDINBURGH MEDAL AWARDS.

Sir, — I find that Mr. Bashford has stated, in the journals of last week, that "Mr. Williamson is from home, and is consequently unable to reply to the letter of Mr. Neilson."

It is not curious that a gentleman should sometimes be "from home;" but it is curious that, having had three weeks before him, in a land of post-offices, Mr. Williamson is still "unable to reply" to my letter. However, people should be thankful for small mercies. Mr. Bashford informs an anxious public that the "reply" is coming. Mr. Bashford may be a prophet, for aught I know; but it would have been more decent if he had not tried to produce an impression that a satisfactory reply can be given to the facts I stated, when there is no prospect of such a reply being impressed in printer's ink.

If the reply is coming, the "dodge" was unnecessary; if the reply is not coming, the "dodge" is—what d'ye call it?—I am, &c., W. Neilson.

Edinburgh, August 14th.

Talk in the Studio.

British Colonial Photography at the Centennial Exposition.—We glean the following relating to photography from comments in the *Scientific American* on the exhibits at the Philadelphia Exhibition. South Australia forwards a series of photographs representing the rural life of the colonists, and the same graphic means is resorted to to show how a telegraph line was constructed across the island. Among the many photographs from New South Wales is one, a view of Sydney Harbour, which measures five feet by three feet four inches, which was printed from a negative of similar size, and one of the largest in the world. Tasmania sends a photograph of the last aboriginal Tasmanian, the sole member of a race supposed by Haeckel to be nearest of all to our alleged monkey ancestors.

M. Schutzenberger has been appointed to succeed the late M. Balard (the late President of the French Photographic Society) in the Chair of Chemistry in the Collége de France.

Illumination by Electricity.—Experiments were made at Paris recently, before M. Baron, Director of the Electric Telegraph, on a new system for dividing the electric light. A single generator has fed with an admirable regularity not less than eighteen lamps, having each a power equal to 100 gas-jets. The effect was wonderful, and the apparatus will be tried shortly at the Lyons railway terminus. The principle is very simple, and was discovered by a working shoemaker. The current derived from a Gramme machine, slightly modified, is sent to a second machine, which rotates before forty-eight electro-magnets, four of these electro-magnets having a force sufficient to give a light equivalent to 100 gas-jets. Twelve electric lamps can be fed at any distance. By a very simple commutator any number of these twelve lamps can be grouped together, so that one, two, or more can be set in the same apparatus. Twelve working on the same point give a real burning sun. The force required for working both machines (the prime mover and the distributor) is derived from a 4 horse-power steam-engine. The experiments at the Lyons railway will be tried with sixteen lamps, and an engine of from 6 to 7 horse-power. The light will be equal to 1,600 gas-jets.—*Nature.*

"The Photograph Rock."—The *Echo*, in a notice of the numerous and interesting exhibits at the Philadelphia Exhibition, says:—"The newly-incorporated State of Colorado—in future to be known as the 'Centennial State'—is fitly represented by a collection of fauna, and a singular specimen of what is termed 'the photograph rock'—a piece of stone four feet in length, upon the smooth surface of which is the representation of a pine bough, all its delicate sprays being beautifully sketched as though by the deft hand of an artist. This remarkable delineation penetrates the specimen, which is three inches thick, plainly showing that it was originally formed by iron and manganese passing through the rocks in a liquid condition. Wisconsin sends two portraits, one of Joseph Croote, who is alleged to have lived to be one hundred and forty years old, and who died ten years since; the other of a squaw, who is said to have attained the patriarchal age of one hundred and sixty years."

On the Flame of Sulphur and the Different Lights Useful in Photography.—*Riche and Bordy.*—The authors have followed up the researches of Delachanel and Mermet, and have tested the photogenic power of various flames, and arrive at the following results—the weakest photogenic flame being reckoned as unity.

Oxyhydrogen light	1.1
Drummond light	3
Zinc burning in oxygen	3 to 4
Magnesium light	5
NO_2 with CS_2	6 to 7
Oxygen upon CS_2	7
Oxygen directed upon sulphur	8

To Correspondents.

Pyro.—No. 1 is a good portrait, well lighted and posed; No. 2 is hardly so successful. We do not know the papers you mention; but there are many good *Rive* papers in the market.

Coloured Photographs.—An accurate description of the process has not appeared. The photo-chromic pictures in South Kensington are by M. Vidal's process, as you surmise. We can, however, tell you nothing precise about them.

Daguerreotype.—Take off the frame carefully, and pass a soft silk handkerchief over the face of the Daguerreotype. Wash in clean water, or water mixed with a little alcohol, and then dry spontaneously. If the image is still clouded, and a deposit is visible, it must be washed with a cyanide of potassium solution to clean it. Do not use more than two or three grains of cyanide to the ounce of water, and wash well after treatment.

Photo-lithograph.—There is no patent.

Enquirer.—Not till November or December. Either of the London Societies would no doubt be glad to have a paper from you.

Retouche Photographique.—Several works have been published which treat of retouching—one by M. Piquepé has just been issued by our Publishers; if you are, however, quite a beginner, a few practical lessons would probably be necessary.

Microscope.—Several papers have been published on the subject, as you will see, if you will consult the Index to the News. M. Girard, of Paris, has worked on the subject very successfully.

P. P.—Unless you contemplate printing in large quantities, it would be hardly worth your while having the carbon tissue forwarded to you ready sensitized, especially during the very hot weather we have been lately experiencing. It soon becomes insoluble in summer time, or, what is almost as bad, very dry and brittle, when its manipulation in the pressure-frames is somewhat difficult. For these reasons it would be well for you to try the tissue first of all unsensitized. Full particulars for carrying out the processes will be given you by the Autotype Company. The Lambertype materials, &c., are also to be had from the Company, and from it only. We have seen some very fine specimens of portraiture by the carbon process, quite equal to silver pictures.

Anxious Photo.—The award of the jury is not yet known; at any rate, we have not yet heard of it.

Dry Plate Worker.—1. We cannot advise you. 2. The coffee process, as also that of Colonel Wortley, are very good. The latter is more rapid, but coffee works very cleanly. Both are admirable as regards their keeping qualities. 3. M. Warnerke will no doubt advise you; his address is Linden Grove, Peckham.

Copyright.—Certainly not; you must ask the lady first of all. Few sitters, especially those before the public, refuse a photographer's request for permission to publish; but you must get permission before you have a right to offer the portraits for sale.

F. M. S.—The ownership of the picture and the copyright do not run together. You may purchase a painting, but somebody else may buy the copyright. Therefore, unless the copyright belongs to the owner of the picture, you must not copy. The other point we can hardly advise you upon. Something similar to what you mention is practised, we think, by photographers; but perhaps your *modus operandi* is worth purchasing.

W. T. R.—We cannot say for certain, but we think Messrs. Newman & Co., 24, Soho Square, could meet both your wants.

John Woking.—There is only one photographic exhibition, which will be held in September. See announcement in last week's News. There is an evening Technical Exhibition under the auspices of the South London Society, of which due notice will be given.

J. H. S. is about to start upon a walking photographic tour through Derbyshire with dry plates, and desires to know what are the best spots to visit for scenery. Can any of our readers give a few words of practical advice?

Alfred Goodchild.—So far as we know, the dealer to whom you allude is perfectly straightforward in his dealings, and we can therefore only assume a miscarriage of letters. He has advertised in the journals for several years past. You had better write him again.

A Lady will feel obliged if any contributor to the News will tell her how to focus with a mirror, and do away with the black cloth. She has fitted a mirror to the side of her focussing glass with a black calico gusset top and bottom, but finds she hardly sees any of the picture reflected on the mirror, and could not be sure of her landscape either as to size or sharp focus.

C. M. M.—We fear there is nothing left but to reduce your silver in the crucible, or hand it over to a refiner for that purpose. From the circumstance that your precipitate is of a violet brown, we think that some of the silver has been acted upon by light, but even then it should dissolve in pure nitric acid. The method detailed by Marshall Wane should certainly have answered your purpose.

Charbon.—Next week.

Several Correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. Barraclough, Harrogate,
Photograph of the Mayor of Ripon and twelve others standing before Entrance to Ripon Skating Rink.
Messrs. Symonds and Co., Portsmouth,
Photographic Group of H.R.H. the Prince of Wales, Duke of Edinburgh, and Officers of the *Serapis*.
Mr. G. Bruce, Dunse, N.B.
Two Photographs of the late Mr. W. Hay.
Mr. Goodchild, Redcar,
Photograph of Mr. W. Ward.
Mr. H. Gregson, Luton,
Five Photographs of Rev. R. Berry.
Dr. J. Gale, Newton Abbott,
Two Photographs of Torquay Lifeboat.
Three Photographs of Mary Brundret.
Mr. M. Brooks, Whalley, Lancashire,
Photograph of Monumental Slab found in the River Ribble.
Mr. J. F. Long, Exeter,
Two Photographs of Mr. Robinson Watson.
Mr. Cooper, Macclesfield,
Two Photographs of Rev. Dr. John Hall.
Mr. Worsnor, Rothbury,
Photograph of Town of Rothbury.
Mr. Long, Exeter,
Photograph of Mr. Robinson Watson.
Mr. E. Ashton, St. Ives, Cornwall,
Photograph of Group of Wesleyan Ministers at Hayle, Cornwall.
Mr. G. Lydford, Shaftesbury,
Photograph, Laying Memorial Stone, Wesleyan Chapel, Gillingham.
Messrs. Tyley, Bristol,
Two Photographs of Mrs. L. Coale's Monument in Arno's Vale Cemetery.
Mr. H. Bevan, Lowestoft,
Two Photographs of St. Margaret's Church, Lowestoft.
Mr. Gregson, Luton, Beds.,
Two Photographs of Rev. Mr. Millican.
Mr. E. Ashton, St. Ives, Cornwall,
Photograph of "The Knill's Festival."
Mr. G. Sadler, Cardiff,
Photograph of Mr. and Mrs C. Tree,
Mr. Hulland, Tamworth.
Photograph of St. Editha's Church, Tamworth.

The Photographic News, August 25, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Sale of Poisonous Drugs—Recording the Progress of Works by Photography.

The Sale of Poisonous Drugs.—In the controversy which has been going on for some time in the contemporary press anent that *cause celebre* the Bravo case, a good deal has been said about the facility that exists for obtaining poisons, and the photographer is mentioned as one who can purchase any quantity of deleterious drugs he may desire. Cyanide of potassium, which is so poisonous that even a few grains may prove fatal, was cited as a compound that can be purchased everywhere without difficulty, and the question has been raised whether this is as it should be. It is hardly fair, we think, to make such a statement; for although practically any one, if he is only determined, can obtain it, still cyanide of potassium, as a rule, is only supplied to people known to be in the habit of using it industrially, and no chemist would think of serving the article if he thought his customer had no clear idea of its nature and was not familiar with its properties. If a man can purchase cyanide of potassium under one pretence, he can also purchase phosphorus under another; so that we can hardly see how further restrictions in the matter would help. There is, for instance, a law or custom which forbids a chemist to supply more than a certain number of drops of laudanum to any customer; but the latter can easily go to half a dozen shops, and thus become possessed of quite sufficient to act as a poisonous dose. You can do little else than have recourse to ordinary restrictions in the sale of poisons, for if a man has made up his mind to obtain a quantity of this or that drug, it is scarcely possible to prevent his doing so. Suppose for one moment that a law was passed to the effect that no cyanide of potassium is to be sold either to photographers or others without the production of a licence, it would after all be of very little benefit. Cyanide of potassium, though a most deadly drug, is not the only poisonous compound photographers have to do with; there are the mineral acids and pyrogallic acid, which would act almost as efficiently, and far more cruelly, upon the human system than cyanide of potassium, and the same may be said of the mercury and other compounds to be found in the photographic studio. Surround these articles one and all with restrictions, and you do not any the more prevent poison from falling into a man's hands; he can still purchase a halfpenny box of lucifers anywhere, and the tips of these are quite enough to poison him. There are numerous articles in every-day use that might be employed as poisons, were people minded so to do. No doubt in photographic work there are poisons of great virulence used, and as much care as is possible should undoubtedly be exercised in the sale of such a compound as cyanide of potassium. But beyond a certain point you cannot go, and it seems to us that the Act of Parliament for the sale of poisons is as strict as it well can be. There are many things, curiously enough, in common use which, while not known to be poisons, are among the most injurious of bodies, and the now famous tartar emetic, or tartrate of antimony, may be mentioned as one of these; in this case probably quite as much harm would be done by restricting their use and branding them as poisons as by letting them alone.

Recording the Progress of Works by Photography.—The application of photography by contractors and overseers of works appears to be very generally adopted. In the construction of a line, as length after length is completed, it is the custom to take pictures by means of the camera, which demonstrate very clearly the nature of the embankment, cutting, or level, upon which the rails run. Such pictures show exactly the nature of the work that had to be performed, and also furnish proof of the progress that has been made. In the case of the head-quarters of a company being far removed from the works, this last quality of a photograph—that of acting as a check—is very useful, for photographs attached to a report indicate at once how far a line has been carried, and serve as a certificate of work done, upon which, maybe, payments have to be made. In canal and drainage works the camera is employed in a similar manner, and we have before us a plan which has been projected to indicate the condition of a stream for draining mines in the Black Country. The cutting or stream, it appears, is upwards of three hundred miles in length, and, besides mapping it out, there have been taken during its progress photographs from different points of view, which demonstrate better than anything else what is the nature of the stream and of the country that it passes through.

FRENCH CORRESPONDENCE.

Sounds Recorded by Photography—Carbon Transparencies for Enlargements—Photography and Crime—Exposing by Means of the Electric Light.

The article which appeared lately in the Photographic News upon the possibility of recording sounds by means of photography I have read with a considerable amount of interest, and it has suggested to me a few reflections. Like the writer of that article, I think that we shall be able one of these days to reproduce sound by signs upon paper—I do not say words—in the form of curves, which may be termed automatic stenography. At the same time, it appears to me that such results can only be observed to a very limited extent. In speaking, we have not only to deal with intonations more or less sharp, which are represented by vibrations more or less rapid, but there is the articulation to be considered, which alone permits us to express our thoughts. By means of the processes elaborated by Mr. Barrett, Dr. Tyndall, and M. Konig, it is easy to understand how a series of sounds may be registered as a musician might note them; but the words themselves would scarcely be reproduced in such a manner.

And, moreover, in the instrument of M. Konig, it seems to us that the breath which escapes with more force when you pronounce such letters or syllables as *b*, *ba*, *t*, *ta*, &c., should act upon the elastic membrane and upon the flame with more energy than when you articulate such letters as *a*, *o*, &c., whatever may be the other intonations or vibrations expressed.

There seems to be much to clear up here, for the matter is in the same uncertain state as Mr. Crookes's Radiometer, about which people are still disputing, not having yet made up their minds whether it is light, heat, magnetism, &c., that sets the apparatus in motion. So it is with M. Konig's apparatus, we do not as yet quite understand it.

No doubt we shall, however, be able at some time to record sounds by photography in the same way as we do light at present, as also the variations of the barometer, the thermometer, terrestrial magnetism, &c., the beating of the heart and pulse, respiration, and all the movements of the living organism.

During a recent visit that we paid M. Liebert, we had occasion to admire the carbon transparencies destined for the production of enlargements. These pictures were of unusual sharpness and clearness, far surpassing those produced by any of the old processes, and as to the simplicity with which they are obtained we can ourselves bear witness. A solution of gelatine is prepared upon a water bath, the material having been allowed to swell for an hour first of all in cold water. One gramme of chrome alum is dissolved in a small quantity of warm water, and this is then added to the gelatine solution little by little, taking care to stir the while. You filter, and while the solution is still tepid it is poured upon some perfectly clean glass plates, in the same way exactly as if you were handling collodion. The films are dried, protected from the dust, and finally the plates are put away in grooved boxes, where they will keep good an indefinite period. It is necessary to take the precaution of marking the gelatine face so that it may be recognised afterwards.

These plates serve as a definite support for the positive pictures, which are printed in pigmented tissue containing but little gelatine, but highly charged with fine colouring matter that has been filtered.

The sensitizing is done in the ordinary way, but the printing must be much more vigorous than usual, the time and pose being about double.

When you are about to develop the image, the gelatined plate is plunged into a bath of cold water, so that the superficial coating may be softened, and after a few minutes the printed tissue is also immersed, and when flat is put into contact under water in such a way that the two gelatined surfaces touch one another. A piece of rubber cloth is put over the tissue, and a squeegee passed over in the ordinary way to get rid of the air-bubbles.

We repeat, that the transparencies thus obtained have a marvellous clearness and fineness.

This week has witnessed the execution of a man whom photography might perhaps have saved if it had only been employed in time and in the proper way. The crime of which the unfortunate was accused was difficult of proof, as there was no witness. The accused had killed and buried in a cellar a woman with whom he had cohabited, and whose property, money, furniture, &c., he had appropriated. The man avowed that he had killed the woman, but denied having entertained any criminal motive. According to him, there had been a violent dispute between the victim and himself at the moment when she was passing the cellar door; carried away with passion he had threatened her, and by an unfortunate movement she was precipitated backwards down the stairs. Finding she did not move, he proceeded to bury the corpse without undressing it. When dug up the surgeons only found a fracture at the back of the skull to account for death, coinciding with the account given by the prisoner. But the question arose, was the body clothed or not? Upon this point there seemed a good deal of uncertainty. Two sketches were executed for the purposes of the trial; the one showed that the deceased had on a chemise and petticoat, the other depicted the body in a naked condition. This was a most vexing matter, for if the accused had told a true story he was an involuntary murderer, and could only be punished with a few years' imprisonment; whereas one who murders wilfully suffers capital punishment.

Nothing would have been easier than to have proved the fact of clothing being on the body or not by means of photography. But although the Préfecture de la Police is now provided with a special studio and operators, this step, for some unaccountable reason, was not taken; even in a dark cellar a picture might without difficulty have been taken by the aid of an electric or magnesium lamp. When one has seen the beautiful pictures taken in the interior of the new Opera House with so much success by M. Levy with the aid of a Dubosq lamp, it is impossible any longer to deny that photography of this kind is surrounded by insurmountable difficulties. It is not sufficient that the police should be provided with a photographic studio; the operators should be *au courant* with all the resources at their disposal. They should, if it is in any way in their power, protect the public as also the accused, and not neglect any means to arrive at the truth.

Ernest Lacan.

PHOTOGRAPHY AT THE AMERICAN EXHIBITION.

BY DR. H. VOGEL.

We resume Dr. Vogel's report upon the photographic department of the American International Exhibition. He proceeds:—

Besides in the Main Building, there are photographs exhibited in Memorial Hall, especially Swedish and Norwegian, and some German (of the Photographic Society in Berlin). All others received their places in the Photographic Hall. Nearly three-fifths of the hall are filled with American photographs; and when we cast a look over the same we notice instantly a great difference between the American and European pictures. Europe has sent nearly exclusively plain photographs (negative retouches not excepted), and indeed the plain pictures are the main exhibit of the European photographers; while America has exhibited a great number of life-size pictures, executed in crayon, pastel, and oil. We see at once that the position of the American photographer toward the public is an entirely different one from the European. From him the people expect work which in Europe would belong to the artist. In Europe portraits in crayon, pastel, &c., are not known as productions of photographers. Now many, perhaps, will make the remark that they indeed do not belong to the line of photography; but certainly it would be wrong if we would exclude these works, which are ordered, executed, and delivered in the atelier of the photographer. If in America crayons, pastels, &c., are executed in the atelier of the photographer, we have, of course, to judge them also. The art jury has therefore to look only at the result; the way and manner of production is a question which, for the artist, is to be a secondary consideration. At the Paris Exhibition, in 1867, they would probably have excluded these photographs, executed by the assistance of a designer, from judgment, as there the jury consisted only of photographers, who wanted the plain photographs to be acknowledged. We notice, therefore, how different the point of view is from which we have to judge the photographer, as it certainly would be for a jury, consisting in the greatest part of artists, the most competent to judge about pictures in oil, pastel, or crayon.

It must be acknowledged that the Americans show an astonishing skill in the production of these life-size pictures. In Europe we would search in vain for hands to execute the same. Such pieces in crayon as exhibited by Kurtz, of New York, must be considered as first-class work; also the charcoal drawings by Sarony. Here a fine understanding of the form of nature is visible, which assists considerably in the change into the stroke manner so necessary for a crayon. Kurtz made in this respect a further step. He has noticed very well that there exists a difference between the tint of a photograph and the tint of a crayon, which is so much more apparent when the photograph changes after some time. He therefore prefers to transfer, so to say, the whole picture into charcoal, and then to take prints of the same by means of a certain process. In this manner a whole picture in crayon is produced, whose durability is guaranteed, a progress not to be depreciated, though the fact that at last nothing remains of the photograph in the picture is of no consequence. The artist judges only the final result, and does not care about the chemical composition, and just as well, as there is nothing left in the plain photograph of the original negative taken at first.

It is well understood that in these crayons, and also in pastel and oil pictures, the individual differences of the artists are remarkably apparent, as the quiet, precise, artistical harmony of the whole by Kurtz; the effective, thorough work by Sarony; the peculiar inclination to sharp-pointed effects by Ryder (Cleveland); the conscientious work by Bradley and Rulofson, Gutekunst, Notman, and others. The manner of cutting out life-size photographs and pasting them on backgrounds, to be worked over by drawing, seems to me to be a difficult matter; roughnesses in the contour are too easily seen.

The photographer being no artist, or having no artists at his disposal, must leave this field of work to his better situated colleagues.

Besides these pictures, which give a peculiar expression to American photography, there are a great number of plain photographs of all sizes, showing that the American photographers are in every respect at the highest position of the art; but what many wished and expected, a characteristic new style, is not to be seen at the Exhibition. As long as such are not existing, we still have to use the old styles, and therefore the Adam Salomon and the Rembrandt effects are as yet performing their great part of the Exhibition. Many photographers show a predilection for them, like Anderson, in Richmond; Kent, Rochester; and Kiewning, in Greifswald (Germany).

Yet it is much more astonishing to find that, properly speaking, the father of the Rembrandt effects, Kurtz, has disdained to exhibit them; but, on the contrary, has sent a large number of plain photographs, all of which avoid the dazzling contrasts of pitch-black and snow-white. In their place is to be observed a mild weakening in tints, which by the public is considered as less effective, but which certainly will attract the sympathy of the judge of fine arts. As in lights and shades, there are also avoided all extremes in position and illumination.

A quite different character is to be seen in the pictures of Sarony; they abound with what the Frenchman calls *chic*. We may shake the head as much as we please about the bold positions, the daring effects of light, they are *chic*ful anyhow; they show the artist. It is surprising how well he understands how to adjust the too long and unpractical Promenade size to his figures; it looks as if the size was cut for the figures. In respect to various positions, Sarony produces some astonishing; he is never in want for ideas, and as he likes also strong effects of light, his pictures give an impression of brilliancy. We only regret that nearly all of his pictures show something of a theatrical air.

Right next to Sarony are the exhibits of Rocher, in Chicago, who this time has sent only plain photographs. He gives the most of his attention to the whole arrangement of the picture, to a stylish decoration, and a genré-like conception. The most of his pictures show in their selection of position, and their subtle gradations of tint, a certain nobleness of appearance which makes them very attractive, as in the group of the Two Sisters, Before the Looking-Glass, the Fortune-Teller, the Lady in Rococo Dress, and the excellent imperial border card.

The exhibits of Gutekunst, in Philadelphia, are grand. Besides large photographs of thorough work, is a long row of pictures of medium size, among them especially half-length pictures in Cameo style, pressed out oval and on deep dark backgrounds, which are finely executed. Besides these, there are among his exhibits a large number of landscapes, which seem to be produced by combination printing. We think they are a little too dark, but they show that Gutekunst is an artist in many respects.

Among the portrait photographs there are backgrounds which attract a great share of attention, and hereby ought to be mentioned that America has an artist who produces very excellent backgrounds, namely, Seavey, in New York. I wish we had some one like him in Europe; but there, unfortunately, we are obliged to paint the necessary backgrounds partly ourselves. In deepness of tint, perspective, and plasticity of effect, Seavey's backgrounds are certainly unsurpassed. Just as recognisable are his plastic firesides and similar pieces.

Kent, in Rochester, exhibited several pictures which appear in half life-size, and, as advertised, are printed from direct negatives. The most of them are of the Rembrandt effect, and have a certain brilliancy. We find the same in Landy's pictures; but it seems to be a very precarious undertaking to try to represent the ages of man, after Shakspeare's known poem. Such a task should have its difficulties even for an artist, and can be considered as unsolvable by photography.

Landy's pictures of children are well known; besides him Hesler, in Evanston, and Schwind and Krüger, in New York, have delivered good pictures of children. The groups of the latter have an effect of uneasiness, on account of placing things that are too light in the foreground. Mosher, in Chicago; Broadbent and Phillips, Philadelphia; Bigelow, Detroit; Alman, New York; and Bradley and Rulofson, in San Francisco, have delivered work in plain portraits which is worthy of acknowledgment.

Especially ought to be mentioned the enlargements of Paxon, in New York; he delivers them plain, and seems, to judge by the exhibited specimens, to receive numerous orders from foreign photographers. If we count, besides these mentioned, Brady, in New York; Gubelman, New Jersey; Wenderoth, Philadelphia; Cox, Baltimore; Hardy, Boston; Taylor, Philadelphia; Rice, Washington; Pach, New Jersey; and Freeman, Texas, then we think there can be no complaint about neglecting the branch of portraits in the American department.

The landscape compartment embraces a smaller domain, though among them are most respectable pieces. In the first line stands Watkins, San Francisco, with his California views; next, following him, are Houseworth, and Bradley and Rulofson, San Francisco; they have delivered especially large prints. After them are many photographers who have taken landscapes in connection with architecture, namely, Sweeny, in Cleveland; Reid, Paterson, and Doremus, of the same place. The latter, to judge by the picture, had a floating atelier on the Mississippi, and went with it from place to place, or followed some such original wandering existence.

Pach, in New York, is employed in taking pictures of horses, besides landscape scenes, and also outdoor groups, in which he is not without success.

Black, in Boston, has sent a row of his well-known Arctic pictures. In strong contrast to them are those of Marshall's. There icebergs, here hot springs, the renowned Geysers of the Yellowstone, in Colorado.

More is yet represented in the branch of stereoscopics, of which Bierstadt, in Niagara, has the greatest exhibition; he has six hundred pieces exhibited, among which are stereos from all parts of the world.

Further are to be mentioned Stoddard, Glen's Falls, Reilly, Yosemite Valley, and Cremer, with views of Philadelphia, and fine graphoscopes. Thorne, in New York, and Butterfield, in Boston, have also delivered several prints with success. Alman, in New York, is distinguishing himself by clouds in the English style.

PHOTOGRAPHY IN CONNECTION WITH THE OBSERVATION OF THE TRANSIT OF VENUS AT ROORKEE.

BY CAPT. J. WATERHOUSE, ASSISTANT SURVEYOR-GENERAL OF INDIA.*

Preparatory Work and Drills.—One of the first things to be done before beginning the drills was to examine the whole stock of glass, and carefully select about 200 of the best and most free from flaws, which were carefully set aside to be used for the Transit.

The dry plate trials were resumed with the advantage of having a suitable instrument to work with. The beer-albumen and other processes that had been found more promising in Calcutta were tried again, but were found not quite satisfactory with the sun; the tea and coffee processes, which I had not tried in Calcutta, were better, and I finally adopted a modification of the coffee process recommended by M. Constant, of Lausanne, substituting albumen for gum to avoid the tendency to blistering so common when using gum, and also with the view of lessening photographic irradiation, against which the coffee proved a further protection. These plates were easily prepared and were found fairly sensitive, easily intensified, perfectly clear and free from blurring in the shadows.

The glass plates, having received a thin coating of albu-

Continued from page 3[illegible].

men as a substratum, were coated with collodion, and sensitized by a somewhat prolonged immersion in a 40-grain silver bath, then washed in four changes of distilled water, and finally immersed in a resensitizing solution, or so-called preservative, composed of

Dried albumen	2 grammes
Sugar	12 ,,
Coffee infusion made by boiling 30 grms. of coffee in 360 c. c. of water ...	300 cub. cents.
Water	300 ,,

and then drained and dried without heat.

As soon as arrangements were sufficiently advanced, preliminary drills were commenced with the object of finding out the best mode of working in the event of dry plates being used, and after a few trials it was arranged that instead of developing every twelfth dry plate, as proposed by the English observers, every fifth plate should be prepared by the wet process, and developed at once, to ascertain if all the adjustments were correct, the necessary alterations in the exposure of the plates being arranged by trials beforehand.

From some cause all the dry plates prepared at Roorkee were covered with spots, some transparent, others opaque and comet-like, and as it was impossible to trace the cause of these spots or to avoid them, even with the most careful precautions, trials were made, about the 17th November, to ascertain if the ordinary wet process could be used instead, and, after working a few days, it was found that there was no difficulty in keeping a regular supply of plates every two minutes by the use of four sensitizing baths. The superior convenience of working by the wet plate system, and the great saving of time and trouble that would be gained, became so manifest that it was definitely decided to adopt it, and thenceforth the wet plate drills were carried on daily between the hours of seven and twelve, during which the Transit would take place; as a rule, in the early morning and forenoon, alternately, sometimes twice during the same day. Particular attention was given to practising the mounting of the Janssen slide by signal, and again unmounting it and resuming the ordinary plates in the interval.

Although the use of dry plates was said to possess the great advantage of enabling irradiation to be much diminished by the use of albumen in the re-sensitizer, and also in reducing the shrinkage of the film to a minimum; as well as great convenience in preparing and developing the plates at leisure free from excitement or hurry, and in facilitating the working of a large number of plates with a small staff of assistants, the substitution of the wet process had many advantages in avoiding the very tedious operations of preparing and developing so large a number of plates, which alone would have taken up about two days before and after the Transit, and more particularly in enabling the state of the work to be seen throughout the Transit and any necessary alterations to be carried out immediately. The manipulations of the wet process were perfectly familiar to all my assistants, and by a division of labour they were able to carry on the work with ease and without the slightest confusion.

By giving the films a substratum I hoped to avoid any shrinkage of the collodion in drying, and by placing pieces of wet red blotting-paper behind the plates to lessen the tendency to irradiation.

My programme of operations having been drawn up and approved by Colonel Tennant, the first rehearsal took place on the 28th November with tolerable success, and several points were noticed as requiring modification. After further practice, a second full rehearsal took place on the 2nd December, and a final one on the 6th, which was very successful; 120 six-inch plates with six Janssens being exposed in the course of the time the Transit was calculated to last.

The preparations for the Transit itself, such as numbering and cleaning glasses, preparing and testing baths, and examining the minor adjustments of the instruments, were commenced about a week beforehand.

Unfortunately the weather for a few days before the Transit was very cloudy, and most unfavourable for trials of chemicals and testing the focal adjustments of the instrument, which caused some trouble and uncertainty.

Although it was determined to adopt the wet process entirely for the Transit plates, it was considered desirable to have a small supply of dry plates prepared in reserve in case of accidents, and to be used, if necessary, at times when the supply of wet plates could not readily be kept up. About a dozen of the six-inch and four of the Janssen plates were therefore prepared by the coffee-albumen process already described, using a highly bromized collodion recommended by Captain Abney for sun pictures, which gave an intense picture with considerable sensitiveness; but, owing to the short time between receiving the materials from England and their being used, this collodion had scarcely time to ripen properly, and so could not have a fair trial. Captain Abney's formula was—

Thomas' bromized collodion... ...	20 ounces
,, iodized	20 ,,
Alcohol, s. g. 805	6 to 8 ounces
Pyroxyline	300 grains
Water	120 minims

The plates were developed with the strong alkaline developer recommended by Captain Abney.

One of these Janssen plates and four of the six-inch plates were used during the Transit, and, with the exception of the spots, were excellent pictures, fairly sharp and dense, free from blurring, and in some respects, better than many of the wet plates.

Several days before the Transit 120 six-inch glasses were selected from those set aside as the best, and were numbered with a diamond in one corner consecutively from 1 to 120. A reserve of about 30 plates was also selected and marked with a cross in one corner. The whole of these plates, as well as a dozen of the best circular Janssen plates, were then carefully cleaned and coated, on the unmarked side, with an albumen substratum, consisting of the white of one egg and about one drachm of ammonia to a wine-bottle of water, in order to prevent any rising of the film, and consequent liability to shrinkage. The plates thus numbered and albumenized were arranged in order in five boxes, holding two dozen each, with the marked corners running along the upper left-hand side of the boxes. Each box was then legibly marked with a distinguishing letter, and the numbers of the plates contained in it thus $\frac{A}{1\cdot 24}$. A sixth box containing marked plates was kept in reserve to be used if required, and it was arranged that any plates so used were to be numbered at the time of use with their proper number in order of sequence.

It was also carefully enjoined on the assistants that the utmost care was to be taken to preserve the proper order of sequence of the plates throughout the operations, but that if, by accident, a plate should be left out or any alteration in sequence occur, the officer in charge should be at once informed of it and duly record it. Should any of the plates originally numbered be broken during any of the operations, or put aside from any other cause, their places were to be filled up from the marked plates, and they were to be numbered in their proper order of sequence.

Arrangements were made for providing four nitrate of silver baths of suitable size for sensitizing the six-inch plates, and a larger one for the Janssen plates; besides these, two small baths and one large one were kept ready in reserve in case of one of the other baths getting out of order or becoming temporarily unfit for use. The baths used were new, and about forty-five grains to the ounce (10·2 per cent.)

To be continued.

A LECTURE ON LENSES.

BY JOSEPH ZENTMAYER.*

We come now to the last of the more important aberrations, that is the astigmation, a word coming from the Greek, meaning: not coming to one point. If we focus a well defined, round object, situated in the axis of a lens of a wide aperture, on a screen, we find the image round, even if we move the screen in and out of the focus, the image will get only less sharp; but if we turn the lens sideways, so as to get the image of the same object formed by pencils oblique to the axis, then we will observe that it is no longer possible to form a sharp image of the object, and by moving the screen in and out of the focus, the image appears elongated, horizontally or vertically.

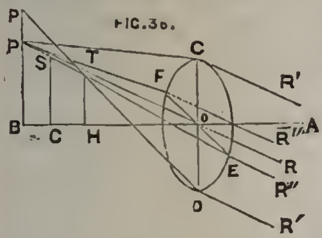


FIG. 36.

Now let us see whether it can be made clear, in the following figure (36). C D is a convex lens, of which A B is the axis. The lens is represented in perspective, as we have to show two planes, in different directions. The radiating point R is situated at infinity, and outside of the principal axis. We will lay a plane through the axis A B, and the point R, which will cut the lens in its diameter C D. Let us lay another plane through the point R, at a right angle to the former, and which will cut the lens in its diameter E F. If we draw the line R *p* through the optical centre of the lens, a ray following it would not be refracted, as we have seen before, and constitutes a secondary axis. R *p* is the line where the two planes cut each other, and consequently belongs to both planes. Let us draw the two extreme rays, R′ C and R′ D, of the diameter C D, which, after refraction are T and *p*′, as we learned by analyzing spherical aberration. If we now look to the other plane, the rays R″ F and R″ E are symmetrical to the axis, and are exactly equally refracted, meeting at the point S. If the lens is now diaphragmed down, so as to improve the aberration of the plane C D, we find that we have for one lens two distinct foci. If we focus, for instance, a brick wall, we will have the horizontal white mortar lines in focus, while the vertical ones are out of focus, and *vice versa*. By looking to the figure, you can easily see that that universal doctor in optics, the diaphragm, will also cure astigmation, at least will bring it to a minimum. Fig. 35 will suggest a way by which astigmation may be destroyed almost completely. The diaphragm D divides the lens L into an infinite number of lenses, of which each acts on a different radiating point, and the pencils, in or out of the axis, strike the lenses almost normal, hence such a combination is not only nearly free of distortion, but of astigmation also.

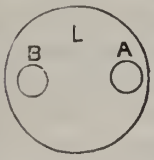
Many of you are aware that in nearly all human eyes there exists an aberration, also called astigmation. Although in its effect similar to the astigmation of lenses, just mentioned, it is of a different character. Nature intends that the curves of the cornea and crystalline lens of the human eye should be spherical; but the exceptions seem to be the rule. The curves of the cornea and crystalline lens of the eye are, in nearly all cases, more or less elliptical, egg-shaped, and consequently have in one meridian a longer focus than in the other. If such an eye brings the image of a line parallel to one meridian, to a focus at the retina, the images of lines parallel to all the other meridians, do not collect at the retina, especially the one at right angles to the former, and a distorted, blurred image is the result. The advancement of science has lately enabled our oculists to correct this evil by spectacles, of which the glasses are parts of cylinders, instead of spheres.

Now, knowing all the defects of lenses, and the different modes of correcting the same, let us look back to that primitive instrument—the pin-hole camera. The pin-hole camera is free from all the errors, as spherical and chromatic aberrations, distortion, curvature of field, astigmation; and the only objection against it is the extremely small aperture. What an amount of speculation and hard labour of the most eminent men were necessary to furnish a substitute, equally free from errors, having a larger aperture, giving a brighter image. And, even now, none of the aberrations can be completely corrected, and the best that can be done, and that for a limited aperture only, is to reduce the errors so far as to diminish their extension, so as to make them appear to our eye at a smaller angle than the eye is able to distinguish. In lenses used as objectives, where the image is magnified by high eye pieces, even that is extremely difficult, as the errors are also magnified. Our most celebrated opticians, such as Fraunhofer, never attempted to give a telescope objective a larger aperture than the focus divided by ten, except in very small pocket telescopes. And his larger telescope, the one he made for the Dorpat Observatory, and which he considered his best objective, has a focus of 160 inches, while the aperture is only 108 lines, that is 1-17th of the focal length, and its highest magnification is 720 times. The larger telescopes of Dollond are nearly twice as long. The same artist, Fraunhofer, took precaution to warn young opticians and amateurs not to listen to the very natural desire to try their skill on larger apertures, and giving higher magnification, if they do not wish to be disappointed, and lose time and money. But the school of experience seems to be the only one to cure this desire.

But here I feel bound to mention that a few years ago, Mr. Steinheil, of Munich, read a paper before the Academy of Sciences of that city, on an improved telescope objective. It is composed of four lenses—one positive crown glass lens, combined with a compound negative lens, which itself is a triplet of two flint and one crown glass lenses. By this formula, a 4-inch telescope is only two feet long, while in the ordinary way it is twice as long.

While I am speaking about wide apertures, I cannot pass without mentioning a very serious obstacle connected with large apertures; it might be called the parallactic error. I was frequently asked why a large photographic objective does not give the same sharp image that a small one does. It is somewhat more difficult to correct a large objective than a small one, even if the aperture stands in the same relation to the focal length. But it is not only this. Suppose we have a large photographic objective, say of six inches aperture, L (Fig. 37). Each part of the lens receives radiating rays from each point of the object, and brings them to a focus at the respective place. Now, if we cover the lens by pasting paper over it, leaving only the aperture A free, we still get an image, only more feeble in light. Again, cover the aperture A, and open the aperture B, you get an image of the same object; but the apertures A and B are say four inches apart. Both cannot give precisely the same image, as they are taken from another base. The images will be similar to the two images of a stereograph, which are taken in a similar way by two lenses. Now open both apertures, A and B, and as the images are not equal, they cannot cover each other, but will overlap, especially the images of the nearer objects. If we now use the whole aperture of six inches diameter, it is clear that we will have an infinite number of images none equal to the other; every one overlapping the other, and the image, necessarily, must be a blurred one. For this there is no remedy but cutting down the aperture.

Fig. 37.



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* Concluded from page 388.

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THE SALE AND USE OF CYANIDE OF POTASSIUM.

Another case of suicide by means of cyanide of potassium has been the means of calling public attention to the facilities which exist for procuring some of the most active and dangerous poisons in quantities sufficient to destroy the lives of "half a parish" without restrictions of any kind or record whereby the origin of such wholesale destruction, if it occurred, could be traced. A dead man is found in a coffee-house, beside him a tumbler containing the remains of a solution of cyanide of potassium, and in his pocket is found a parcel containing upwards of seven ounces of the deadly drug, of which a dose of from three to five grains will prove fatal, containing a label stating the contents, it is true, but without the name of any one who was responsible for dispensing the perilous salt. The wife of the victim stated in evidence before the coroner that her husband, who used cyanide in hair-dyeing, had informed her that he could procure a pound of it at the Civil Service Stores, and "no questions asked!" No record appears to exist, giving information as to where the deceased man purchased the poison found in his pocket. "A Public Analyst," writing to the *Daily News*, says, "nearly every village grocer sells poisons without let or hindrance, and hence whilst the regular chemist keeps a register of sales, the village dealer has no such register, and consequently has a larger sale." Such facts surely constitute a scathing satire on the wonder expressed, during the late elaborate enquiry into the "Balham Mystery," as to where the tartar emetic could have been procured!

The curious part of the matter is, that the sale of poisons is surrounded by precautionary legislative enactments. Without citing the various special Acts referring to special poisons, we may refer to the Act to Regulate the Sale of Poisons of 1868. In the December of 1868 this Act came into operation, by which it was rendered illegal for any one except a registered pharmaceutical chemist to retail the poisons scheduled in the Act, of which, of course, cyanide was one; a penalty of five pounds being imposed upon every sale by other than the properly qualified chemist. And he, too, was bound by penalties if the poison sold were not duly labelled with its name, the word "poison," and the name and address of the vendor, and a due record of the transaction, with the signature of the purchaser, entered in a book kept for the purpose. The passing of this Act naturally caused some excitement amongst dealers in photographic chemicals at the time, and we remember that circulars were issued by several dealers previous to the Act coming into operation urging photographers to lay in a stock of various articles mentioned in the schedule at once, and offering inducements in the shape of favourable terms. Whether in the years which have elapsed since the Act was passed the legislative precautions have been duly observed amongst photographic dealers, or whether the Act has to some extent become a dead letter, we cannot tell. But if co-operative stores, and village grocers are suffered to violate the law, whilst specific and legitimate dealers in a specific class of goods are subject to restrictions, the case not only involves a general public wrong, but is surely worth the further examination of those commercially concerned.

But whether the facilities for the distribution of poisons be restricted or made easy, it cannot be too often impressed upon the minds of all concerned that the use of cyanide in various industries is not a necessity. Whatever value it may possess in the recondite mysteries of hair-dyeing we cannot say; but it certainly cannot be used for such a purpose without risk. Acting most dangerously on the health when absorbed through the skin, it could be easily applied to a more dangerous part than the head. An eminent physician, when once asked his opinion of tight-lacing, said he highly approved of it, as it helped to kill off rapidly all the silly girls, and none but such would practise it. On a similar principle the free use of cyanide in hair-dyes might perhaps be justified. But we will not discuss the point here. In photography the use of cyanide is certainly unnecessary. For fixing negatives hyposulphite of soda is in many respects absolutely better than cyanide. The one purpose for which cyanide is occasionally necessary is the cleaning of tarnished Daguerreotypes, a task which occurs to the modern photographer not once in many years. Yet, notwithstanding all the general danger and all the personal risk, many photographers persist in the employment of cyanide for fixing, simply because some possible greater convenience is found in its use. Possibly if the difficulties in procuring it were greater, or a heavy tax were placed upon its manufacture so as to increase its price, it would fall into desuetude, and such a tax could scarcely be regarded as an unmixed evil. Sir W. Frazer recently gave notice in the House of Commons that he would early in next Session ask for leave to bring in a Bill to amend the laws relating to the sale of poisons. It is quite clear that some steps are necessary, either to enforce existing laws or to frame new and more efficient enactments. The *Daily Telegraph*, in a recent leader, says:—

> It is a most serious matter that the sale of so deadly a poison as cyanide of potassium should be as unrestricted an it seems to be, and that a large parcel of it, containing enough to poison as entire regiment, should be found in a man's waistcoat pocket, without a single word of superscription to indicate the source from which it came. We shall be told, of course, that without cyanide of potassium photography is simply impossible, and that the use of it is also required for various other purposes of trade and art. This may, no doubt, be the case; but, on the other hand, it is merely necessary, in the interest of the public, that rigid restrictions should be put upon the sale of so terrible a poison. If photographers need cyanide of potassium, it would be a most unwise policy to restrain what is undoubtedly a useful and beautiful art by prohibiting the sale of a chemical absolutely essential for its practice. If, however, photographers are to be allowed to have in their laboratories a poison as violent, instantaneous, and deadly as concentrated prussic acid itself, some sort of guarantee ought to be given that the fearful compound shall be kept out of the reach of ignorant or mischievous hands. We have Acts of Parliament which inflict severe penalties upon any one who carries about or stores upon his premises nitro-glycerine or dynamite without a licence. It might be doubted, however, whether a ton of dynamite is, when all the chances of life are taken into account, as dangerous as an ounce of cyanide of potassium might be under conceivable circumstances. There is, indeed, a curious inconsistency, not in the theory of our law with regard to the sale of poisons, but in its operation. Strychnine, deadly as it is, yet is a drug which, as compared with cyanide of potassium, is, if we may say so, inert; or which at any rate is for many reasons far less dangerous, and less likely either to be used as a poison or to be taken by accident. If a man's house be troubled with rats, and he want a few grains of strychnine to rid him of the annoyance, he will have to go through a great amount of most necessary and expedient, but at the

> same time tedious, formality, before a druggist will put it in his power to bane the intruder. Cyanide of potassium, however, lies about in every photographer's studio as commonly as salt upon a dinner-table, and, especially under the light of recent circumstances, the public has a right to demand that a weapon so perilous and so absolutely beyond the range of antidote or other human help should be far more jealously guarded than it is at present.

With the majority of our contemporary's remarks we fully coincide; but we beg to assure it and all concerned that cyanide is not necessary to the practice of photography, and the notion that photography without it is simply impossible is a baseless fallacy.

ORNAMENTAL ENTOURAGE TO PORTRAITS.

That the general effect of a picture is materially influenced by its entourage or surrounding, is a fact with which every one is familiar. The breadth and tint of the mount, the style, the colour, and breadth of frame, are points of vital importance in modifying every picture, from the simplest engraving to the noblest work of a great master in painting. Not long ago we were in the studio of a distinguished modern painter, one of a privileged few, examining the pictures which were intended for the Academy Exhibition just approaching. A masterpiece was before us, which commanded universal admiration. "But it is not finished?" interrogated one of the company. "No: it wants framing," was the quaintly quiet reply. Many artists wisely systematically avoid showing an unframed picture to untrained eyes.

Whilst the selection of the entourage most effective or best calculated to give value to the picture must always be a matter of taste and judgment, there are certain recognized canons which universal taste accepts as governing the question. For oil paintings, gold frames close up to the picture, generally heavy, sometimes varied by the addition of ebony or oak. For water colours, a broad, flat mount of white, or a light tint, or even of gold, within a narrow gold frame. For engravings, a plain white margin is generally effective. But the severe simplicity of black and white permit greater latitude of decorative surrounding, and hence we find that in simple portraits some of the best engravers of the best period of engraving were fond of enclosing the portrait in an effective ornamental border. The representation of a handsome frame, often partially wreathed with drapery, was a favourite device; the arms and crest of the sitter often being combined with the ornamentation. This style of decorating has occasionally been adopted in photography, sometimes with good effect, but, unfortunately, not unfrequently the result has been commonplace and vulgar. In by far the greater number of cases a flat space of some simple drapery in a delicate tint surrounding a medallion portrait, is safely effective, whilst more elaborate ornamentation can only succeed when governed by especially good taste.

Some of the earliest and best examples of the use of ornamental entourage after the manner of the old engravers were produced by Dr. Diamond many years ago. He adopted the felicitously effective method of producing negatives from some of the old engravings amongst his unusually fine collection, and adapting these to the photographic portraits he had produced of his friends. Somewhat similar devices have been adopted by several French artists, and some in this country. We have recently had our attention called to the subject by some examples produced by Mr. Higginson, of Southport, who has adopted an entourage of this kind, for a purpose beyond the mere ornamentation. His special aim is to make a small portrait range with portraits of larger size. For example, a negative of card size only existing, and a picture of cabinet size required, either to fit an album or for some other purpose, Mr. Higginson produces a negative of a handsomely carved frame with drapery and other accessories. These by double printing surround the image from the card negative, and, whilst rendering the portrait more effective, extend the picture to the desired size, whether cabinet or larger. In referring to Mr. Higginson's examples, we must not leave them without a word as to their superb beauty as examples of carbon printing, as well as exceedingly fine photographs. Shortly after receiving Mr. Higginson's communication, we received some further examples from Mr. Warwick Brookes, of Manchester, in which the entourage is made to serve a further purpose beyond producing a large print from a small negative. Mr. Brookes has sent us several examples, all exceedingly fine as examples of artistic portraiture; the aim of the ornamental surroundings being in each case to indicate definite characteristics. Here, for instance, is the portrait of a Freemason, and combined with the frame, drapery, and other ornamental surroundings, we have the working tools and symbols of masonry, the square, the gauge, level, plumb-rule, the compasses, the gavel, the pillars—Jachin and Boaz, and other symbols which give suggestion and character to the picture. An actor's portrait is surrounded with masks of Comedy and Tragedy, and a variety of such dramatic accessories as lend themselves to purposes of decorative surrounding. We have also literature and art typified in similar fashion, and it is clear that the idea is capable of extension in many directions. Ingenuity and good taste will, of course, be imperatively necessary in carrying out this idea, or the failure will be great. In the examples with which Mr. Brookes has favoured us of his "Academy Portraits" these qualities are manifest, and the result is in every way successful.

DECOCTION OF POPPIES AS A PRESERVATIVE.

A correspondent, signing himself "J. M. G.," favours with details of a preservative for dry plates which he found remarkably efficient, giving a high degree of sensitiveness surpassing that obtained by the use of albumen, coffee, or beer. Our correspondent says:—

"I am anxious to draw the attention of dry-plate workers to a preservative which I find very promising, but which I have not seen noticed. I give the whole simple process. Having treated the plate as usual, prepare previously the preservative. Take one poppyhead as got at the shop, break it up and pour on it eight ounces of distilled water; boil, and then simmer for two hours; when cool, or after standing all night, filter and pour into a flat dish. Put the plate into this for two minutes, drain the plate into a small tumbler, then set up to dry endways on blotting-paper in a press. I do not use artificial heat, though a gentle application before storing plates ensures dryness.

"An exposure of one and a half minutes to three or four has given me a very good picture, as compared to beer and coffee plates of six to ten minutes' exposure. The colour is also good. As far as tried, they keep well.

"In more skilful hands this preservative may prove good. It will be a favour if any who try it, or modifications of it, will give their experience in your columns."

A FIELD DAY IN PARIS.

BY AN AMATEUR PHOTOGRAPHER.

I notice in your columns from time to time the experiences of gentlemen who, like myself, sometimes take a pleasure tour with the camera, and it has occurred to me that a short account of a recent trip of my own to Paris with dry plates might be interesting to some of my brethren. Or, at any rate, if the latter find nothing to interest them, my experiences may give them some idea at least of how a photographer may pass his time in the magnificent capital of France, which contains so many fine studies for the camera.

My outfit was not large, it being specially made for travelling: a whole-plate camera neatly packed in a black bag, a supply of prepared films, and a stand. One week before I started, I made application to the Préfecture de la Police at Paris for permission to photograph in the streets and squares, for I knew such a permit was necessary, and this I hoped to find on my arrival, waiting for me at the post-office.

I am not going to describe beautiful Paris, as I came into it early in the morning: its white houses; its long rows of neat shops already open for the day's work; its fresh, clean streets still wet from the flushing they had received from the blue-bloused scavengers with their long besoms. Everybody who has been to Paris knows what a bright impression is made upon those who come direct from coal-burning London, or from the still smokier towns in the North. It was capital photographic weather, too, and as I passed the Grand Opera, the Vendôme Column, the Quays, the Seine, &c., I grew quite impatient to begin work with the camera. But I had not received my permit as yet, so I decided that after calling at the Poste Restante I would spend the day in "gadding about," and begin work early next morning.

There was no letter for me at the Poste Restante, I found, but this did not interfere with my enjoyments for the rest of the day, and next morning early I called a *voiture de place* and told the glazed-hatted coachman to drive to the Préfecture de la Police. I would call for the permit myself, and then proceed at once with my photographic work, I thought, and with this intention I carefully placed my camera and stand beside me in the carriage.

The Préfecture de la Police is situated opposite *Notre Dame*, and I had a long drive before me. However, that mattered little, though whether it was his particular destination, or the dignity with which the red waistcoat and black hat invested him, my coachman proceeded but very slowly on his way. At last I was deposited at the Préfecture, a magnificent building many times larger than our Foreign Office.

"I desire the bureau of Monsieur le Préfet," was my first request.

"Has his Excellency given Monsieur an audience?" replied the official to whom I addressed myself.

"No; I have written to him; and now I desire a few minutes' interview."

"But, if Monsieur has not acquired the right of an interview with his Excellency, it is impossible. It is necessary that you ask for permission for an interview first of all."

"Good; that is just what I came here for; to apply for an interview. I have written, but received no reply."

"You have no reply," said the official; "where did you date your letter from?"

"I asked for a reply to the Poste Restante."

The official could not repress a smile. "And Monsieur thinks that his Excellency would write to the Poste Restante; that is a little strong."

"But I am a stranger here," I protested, "and could give no other address at the time. Pray what shall I do?"

"Well, I will tell you. You must get a declaration from a *Judge d'Instruction*, showing you are a deserving person. This will be forwarded through a Commissary of Police, and then if his Excellency thinks that the application——."

"But it will take two or three days to do all this, will it not?"

"Two or three days, my faith! Fifteen days, at the least."

I saw it was no good to pursue such a hopeless course as this, and therefore took the official into my confidence, told him I only wanted permission to take a few photographs about Paris, and in the end appealed to his feelings so successfully that he began to take an interest in me. Was there no other way of getting the permission? I asked. Could I not go to one of the bureaux direct, and see the gentleman especially entrusted with such matters.

"A good idea, yes. Go to No. 212, on the third floor, the fifth room on your left after ascending the staircase."

I was soon on the threshold of No. 212, and found a polite gentleman seated at a writing-table strewn with documents of all kinds. I stated as briefly as possible what I wanted, and asked him in a beseeching tone to grant me the coveted favour, if it was in any way possible. He did not seem to anticipate difficulty in the matter at all, and my spirits rose accordingly to a very high pitch.

"It is necessary that you should go to bureau 421; it is not here that you should apply. No. 421, two floors higher up, at the end of the corridor."

"Thank you very much." But when I reached bureau 421, I found I was no better off. The chief of the bureau listened most attentively to my story, and then told me he would have been most happy to help me, but I had come to the wrong bureau.

"I am sorry you have had the trouble to mount so high; you must apply at bureau No. 212.

"Pardon, but I have just come from bureau 212, and the chief sent me here."

"Truly? Ah! well then, I would advise you to apply to No. 17 bureau; it is *en face* as you come in at the door. Yes, No. 17 must be right."

I descended accordingly, but No. 17 proved no more the proper bureau than 421. From the fact, however, that No. 17 wanted to send me back to 212, I began to think that, despite the first gentleman's assurance to the contrary, that he must know something of the matter. Without exaggeration I went to nine bureaux, one after the other, in this vast circumlocution office, and could observe every now and then when I looked out of window that my Jarvey had made himself comfortable, and with his legs on the splash-board and his shining black hat on his knees had fallen fast asleep. Three mortal hours elapsed before I gave up the search for good, and then returning to No. 212 once more, I told how hopeless had been my errand.

"I am very sorry," said the gentleman. "It is possible that the permission must be sought at the Préfecture de la Seine."

"And where is that?" I enquired.

"At the Palais de Luxembourg."

So I woke up my coachman, and drove off to the Luxembourg. But here I met everywhere with but one answer, to the effect that the Préfecture de la Police was the only department that could grant the permission I craved. Time was getting on, and it wanted but a little while to noon, so that if any work was to be done with the camera there was no time to lose. I took another resolution, and told my coachman to drive to the top of the Rue de la Paix, opposite the Opera House. I saw a policeman standing at a corner, so I at once accosted him. After exchanging a few pleasant remarks, I said—

"Now what would you do if I were to set up my apparatus here to take a photograph?"

"Well, Monsieur, if I could manage not to see you it would be all right. But one of my comrades might be passing, and he would report me if I did not do my duty."

"But what would be your duty?"

"I should seize your apparatus, and take it to the Depôt Centrale, and there it would be sold with other seizures at the general sale every Thursday. I should then conduct you to the station-house, and lodge you in a cell until——"

"Good, good, thank you very much; but I don't think, under the circumstances, I shall attempt any photography to-day. But what am I to do?"

And I then recounted to him precisely how matters stood, and asked him for a word of advice. His view of the matter was to go to the station, see the Commissaire of Police, his immediate chief, who was a *bon enfant*, he assured me, and get his permission. I thanked him warmly, got into the cab again, and was soon at the station-house.

"Can I see M. le Commissaire?"

"Yes, in a little while; he is engaged."

The official, in this case, was a small grumpy man, with a high opinion of his self-importance. I sat down at a request, which sounded very much like an order "Asseyez vous," and presently became aware of a stormy altercation that was going on in the next room, the door of which was partly open. I sat still patiently for an hour, but I did not mind waiting, for I was fully entertained the while. A man had accused another of stealing some valuables, and the noise proceeded from the affirmations and contradictions of the parties, as also from the questioning of a fierce official. The man who had been robbed told his story after a while, despite the terrible interruptions, and then the accused, who, to say the least, was evidently a doubtful character, discharged a volley of abuse uttered with such rapidity as is only in the power of a Frenchman to do.

If the official cried out silence once, he shouted it a hundred times, but in the end a lull came over the proceedings, and I heard the plaintiff asked to sign his deposition. This, however, he refused to do unless he read it over first. "What, you refuse to sign?" said the fierce official. "Certainly, I never sign anything till I have read it." "And do you think I am going to read over what has taken me more than an hour to write down? Nonsense; have the goodness to sign." But the man was firm in his refusal to sign the document, and, without more ado, the official called a couple of policemen and marched him off to the cells. Not the accused, remember, but the accuser, taken off to be locked up; it was the most comic scene I have ever seen in my life.

But time was getting on, and, if I was to photograph at all, it was high time I commenced. I began to feel tired now the interesting trial next door had finished, and I got up to walk about a bit.

"Asseyez vous!" called out the grumpy official, with a voice of thunder.

It could not be to me he was talking in that offensive manner, I thought, so I proceeded on my walk; but presently the little fellow darted from his desk, and gripped me by the elbow. This was too much. He was, as I have said, a little fellow of no great strength, and it required not much exertion on my part to twist myself free and deal him a heavy blow on the shoulder as I swung round.

"Go to the Commissaire at once," I roared, losing all patience.

"What, you dare!" said the man retreating, thinking I was about to strike him again.

"Go at once; do you hear? I'll not wait here any longer. Go at once."

And the man did. He soon came back fussing and fuming, but told me the Commissaire would see me.

I need not, I think, continue my story any longer. I saw the Commissaire; I told my tale, and he received me politely enough. But I got no further. My attempt to obtain a permit was fruitless. He would get it for me in the usual way: take down my name and address, inform himself if I were a good man and true; make out a *proces verbal*, and send it forward to the Préfecture de la Police. But it might be a fortnight or three weeks before I obtained what I wanted. It was evening when I took my apparatus out of the cab at my hotel door and paid the coachman his heavy fee.

THE DOUBLE SULPHATE OF IRON AND SODA REGARDED AS AN EXCELLENT DEVELOPING SALT.

BY DR. J. M. EDER AND CAPTAIN VICTOR TOTH.*

Of all the reducing agents employed for the development of the silver image, iron has won for itself the most foremost position, and the form in which it is employed is either that of iron vitriol, or sulphate of iron, or a double salt of the same formed with sulphate of ammonia—the sulphate of iron and ammonia. A discussion, a little while ago, over the comparative value of one or the other, ended in the acknowledgment of the ammonia double salt being preferable, this being more stable in atmospheric air, while its finer and better working qualities were also maintained by some. This latter view, however, found few supporters, although on the score of cheapness the simple sulphate has undoubtedly an advantage.

To become better acquainted with the subject of development with iron salts, it seemed to us desirable that parallel experiments should be undertaken with the potash and soda double salts; not so much for the purpose of bringing to light any particularly interesting facts, so much as to obtain practical data of value.

Of the three iron double salts mentioned, those of potash and ammonia were known long before the soda, whose production was attended with far more difficulty than were the former.

For an accurate knowledge of the double sulphate of iron and ammonia we have to thank Marignac. He observed that the aqueous solution of a mixture of iron vitriol and sulphate of soda (Glauber salts) vaporises at an ordinary temperature in a vacuum, and that the separate salts may be crystallised out unchanged, while sulphate of ammonium under the same conditions yields the double iron salt in question. The double sulphate of iron and soda crystallises easily at 35° Centigrade, or above, from the mixture, in small bluish-green flakes. The formula is Na_2SO_4, $FeSO_4$. $4H_2O$.

The correctness of this is confirmed by Graeger, who gives the following details. "The double salt is very easily dissolved, so that from a hot concentrated solution no crystallisation can be brought about by cooling, although it possesses the quality of separating on the boiling of the liquid in a concentrated form; it can therefore be obtained in the same manner as carbonate of soda. This fact obviously proves that a salt exists with a much larger proportion of water of crystallisation, and which is very easily dissolved, for it is necessary only to bring a concentrated solution of the double salt (which after long standing throws down no crystals) to a gentle simmer, in order to bring about the separation of the above-mentioned double salt. From a concentrated solution there is formed only after a very long time, from continued evaporation, a hard rind, which attaches itself very firmly to the vessel.

According to M. E. Blitz, it is very easy to produce a double salt of iron and soda. Crystallised iron vitriol is dissolved with the addition of two per cent. of sulphuric acid, in its equivalent weight of hot water, and for every 88·8 parts of iron vitriol there is then added 100 parts of crystallised sulphate of soda (Glauber salts). Upon this the fluid is heated, filtered after it has been thoroughly dissolved, and after boiling gently for some time, always stirring the while, it is allowed to evaporate. The double salt will very soon separate in a crystalline form, and on further boiling the amount will be increased. You evaporate, therefore, only so far as to leave still a good deal of liquid present, and then allow it to cool. The fluid portion is poured off, and may, if desired, be employed in the preparation of a further batch of the salt; in any case, however, the loss of this mother liquor in the case of so cheap a material is scarcely worth consideration. The salt is collected upon a filter, and any remaining portion of mother liquor is washed out with a little water; the well-drained crystalline powder is dried between sheets of filter paper.

The double sulphate of iron and soda thus obtained is in the shape of a crystalline powder of a slightly greenish character. It may be heated continually to 100° Cent. without undergoing any alteration. It is less subject to oxidation from the atmosphere than the double sulphate of iron and ammonia. We call attention to the circumstance that in the production of the double sulphate of iron and soda there is a tendency for iron vitriol and Glauber salts to crystallise out at the ordinary temperature; this the experimenter should remember, for if the double salt produced by evaporation is allowed to remain for a little while at the ordinary temperature in the mother liquor, then there become mixed with the crystals of the double salts those of iron vitriol and Glauber salts, as Mohr has already pointed out.

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* *Photographische Correspondenz.*

The properties of the double salt of iron and soda are therefore very satisfactory, both as regards stability and cost. It is less expensive than the sulphate of iron and ammonia, for the Glauber salts employed in its preparation represent a much smaller money value than sulphate of ammonia. The ammonia salts have all of them risen in price, and will in the course of the year rise still more, as these salts are extensively used by farmers in the shape of manure. The same holds good with the potash salts. The substitution of the cheaper soda, therefore, certainly demands our serious attention. As regards its photographic properties, the soda double salt does not differ from the ammonia double salt; they both develop equally well.

It has been said that the double sulphate of iron and ammonia gives finer, clearer, and more detailed pictures, and, for this reason, the sulphate of ammonia in the ammonia double salt combines with the sulphate of silver formed by the double decomposition, and forms an easily dissolved double silver salt, the double sulphate of silver and ammonia, while it leaves the iron vitriol undissolved in the form of a coarse precipitate. In this case, obviously, the already reduced silver and the silver of which the picture is composed, would attract the silver from the solution more easily and with greater regularity than that coming from the slowly soluble and coarse sulphate. Another experimenter seeks to support this theory by detailing an experiment which he tried: he dropped a solution of silver on the one hand into a solution of iron vitriol, and, on the other, into iron and ammonia, and demonstrated in this way the greater solvent property of the ammonia double salt. But this experiment in our hands permitted us to discover no such difference. A more accurate mode of determining the question was to ascertain the precise degree of solubility of sulphate of silver in water, and aqueous solutions of sulphate of soda, potash, and ammonia, in order to find out the behaviour of the other double salts in the operation of developing.

Degree of Solubility of Sulphate of Silver.—As soon as the sulphate of iron developer comes upon the sensitized and exposed plate for the purpose of bringing out the image, the nitrate of silver from the bath which is contained in the collodion film forms, with the sulphuric acid in the developer, the difficultly-soluble sulphate of silver, whose solubility we shall study more closely, as it is certainly not without influence upon the whole action of the development. The question, therefore, is before us: Does sulphate of ammonia increase the solubility of sulphate of silver? Do sulphate of soda and potash work the same, or do they all three behave differently?

To obtain information on the point—for nothing seems to have yet been published on the subject—we made four titrimetric analyses:—

1. A saturated aqueous solution at 18° C. of pure sulphate of silver contained 0·58 per cent. of sulphate of silver.

2. A saturated solution at 15° C. of sulphate of silver, to which 15 per cent. of sulphate of ammonia had previously been added, contained 0·85 per cent. of sulphate of silver dissolved; if before saturation of the water with sulphate of iron there is added 5 per cent. of sulphate of ammonia, then the saturated solution contains 0·66 per cent. of the silver salt.

3. A saturated solution at 18° C. of pure sulphate of silver, to which previously 37 per cent. of crystallised sulphate of soda (equivalent, 15 per cent. ammonia salt), contained 0·80 per cent. of sulphate of silver dissolved a 12 per cent. Glauber salt solution is capable of dissolving 0·65 per cent. of sulphate of silver.

4. An eighteen per cent. solution of crystallised sulphate of potash is capable of taking up 0·76 per cent. of sulphate of silver; a six per cent. solution of sulphate of potash will take up 0·60 per cent. of sulphate of silver.

A consideration of these results shows that the sulphate of ammonia contained in the developer (in the employment of an iron-ammonia developer) which is usually of three per cent. strength, can exercise no influence worth mentioning upon the solubility of the sulphate of silver in the production of the image. The sulphates of ammonia, potash, and soda no doubt increase the solubility of sulphate of silver, but this can be very little in the presence of foreign salts. The presence of the sulphate of ammonia as a solvent agent is therefore unimportant, although, if it were otherwise, the action of the sulphate of soda so nearly approaches that of the sulphate of ammonia that it would make little difference in the end.

Of course all photographic processes have a very subtle influence, and often a small addition of any substance exerts a very material action. In this case we must, supported by the experience which we have obtained in our comparative experiments with developers, declare ourselves on the side of those who believe in the action of iron vitriol used in the form of a double salt, and we prefer such of these as withstand most effectually atmospheric influence. To the double sulphate of iron and soda we shall therefore in future give the preference as a developing agent.

A WORD ON TRANSPARENCIES AND ENLARGEMENTS.

BY A. HESLER.[*]

The great drawback heretofore felt in making transparencies, and enlarged negatives therefrom, has been the "fuzziness" or blurred appearance of the resulting picture Where a transparency is made in direct contact with the negative by any of the known dry-plate processes (if contact is perfect), no blurring will be perceptible, and the resulting transparency will be as sharp as the original negative. Now take this transparency and use it for an enlarged negative by any means I have seen recommended, viz., place in front of your object-lens and pass the light through it, either direct from the sky or reflected from a white screen, and in proportion to the diameters will be the blurring of your resulting negative. I have found that all this can be avoided by placing in front of the negative you wish to make transparencies from, either for the lantern or duplicate, or enlarged negative, first next to the window, or, better still, clear daylight, a porcelain plate (a thin one); next to this two or even three thicknesses of (finely ground) ground-glass, ground side out. Inside of this place your negative, collodion side to the object glass; focus with full, open tube, and, before exposing the plate, insert small stop. The result will be a transparency or negative free from all blurring, sharp and clear as the original negative. Now place this in place of the original negative, and proceed to make your enlarged negative.

I never have seen this idea mentioned by any one, but all who will try it will at once be convinced of the great advantage to be gained by the use of porcelain and ground-glass, as already mentioned.

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[*] Read at the Photographic Society of Philadelphia.

Correspondence.

NECESSITY THE MOTHER OF INVENTION.

Sir.—A favourite and celebrated author, essayist, and newspaper-writer says:—"There is, unhappily, very little *esprit de corps*, and much jealousy and spiteful feeling, in the profession to which I belong." Let us hope, for the good and honour of all, that it is not quite the case with our profession, and that it will always be a pleasure, as in some cases it may prove a duty, to do justice to our neighbour, and give him praise and encouragement when he has laboured diligently and successfully; nay, more, when he has laboured in the good cause, and his endeavours are likely to prove of value to others.

It is my pleasure to be the vehicle through which a very ingenious contrivance, pregnant with artistic results, is brought before that portion of the photographic profession whose labours have lately been connected with carbon printing. Necessity was indeed the mother of invention in this case. The problem to be solved was how to produce a cabinet picture with a C.D.V. negative without resorting to old and known methods of enlarging. This having been accomplished, it was further extended to the next size, and an imperial obtained from a cabinet size negative. The specimens forwarded to the Editor illustrate the results, and he will certainly be the ablest exponent of their merits. Suffice it that I should state that a novel and very charming effect has been produced, and that the credit of it belongs to Mr. George Higginson, of Southport. This gentleman—a very successful worker of the carbon processes—has given further evidence of his inventive genius by his construction of entirely novel printing frames, so arranged, in connection with his other innovations, as to bring carbon printing within very simple and accurate rules; in one word, an entirely unique method of working, by which the most beautiful results are obtained with certainty.

Following the advice given by the Editor of this paper, "that the bright idea should be at once communicated to photographers at large through the journals," the present step is taken, and proof deposited in the *archives* of the News, so to speak, to avoid the possibility at any future time of finding this "idea," which many good judges have pronounced excellent, embodied in somebody's patent.—Yours very truly, F.

SALE OF PRIVATE PORTRAITS.

Dear Sir,—Excuse me troubling you, but recently I have been asked by several of my patrons not to sell or in any way let any of their photographs go out of my hands. In one instance, a lady came in great distress, imploring me not to sell her photograph, as she was in trouble, and her name would probably be in the papers. I told her, of course, that all my negatives were kept as a sacred trust, and that I never by any chance parted with a single carte without a permit from the owner. She at once said, "What a shame about the Bravo pictures!" I find since that all this trouble and fear on the part of my sitters is in consequence of the publication of these horrible copies.

It is scarcely necessary for me to ask you if a photographer can legally publish in such an unscrupulous way photographs of his sitters? Pray insert this, so that photographers generally may have an opportunity of defending themselves, as I am sure such a temptation would have been resisted by the bulk of our profession.—I am, sir, yours truly, W. Fall.

[Of course no respectable photographer would sell or publish portraits of his sitters under any circumstances without their permission. Most of the Bravo photographs issued are copies of drawings.—Ed.]

Talk in the Studio.

The Wagner Festival.—In closing his account of the Bayreuth Festival performances, the correspondent of the *Daily News* says:—"I may add, for the benefit of the English guests, that the King of Bavaria has sent his Court photographer, Herr Albert, of Munich, to take the portraits of all the singers in costume, and admirers of the *Ring* will therefore have the opportunity of purchasing pleasing mementoes of the Bayreuth Festival performances."

Lecture Experiments with Gun-cotton.—Dr. A. Vogel describes several methods of proving that nitrous and nitric acids are among the gaseous products of the combustion of trinitro-cellulose or gun-cotton. A tuft of gun-cotton is placed in a large test glass which tapers to a point beneath, ignited, and covered as quickly as possible with a glass plate. The interior of the glass is immediately filled with the characteristic yellowish red fumes of nitrous acid. When gun-cotton is ignited on a piece of moistened litmus paper, it colours the paper red. It also reddens tincture of litmus, if burned in a beaker glass on the bottom of which is some of the tincture. When burned on a strip of moistened iodide of potassium and starch paper, gun-cotton leaves a dark blue spot. The characteristic test for nitric acid with brucine can be obtained by burning the gun-cotton in a conical test glass at the bottom of which are a few drops of water, and covering with a glass plate. The water at the bottom of the glass has a strongly acid reaction, and exhibits this reaction if placed on a watch-glass in contact with brucine and sulphuric acid. A curious reaction takes place when an ounce of collodion is mixed with an equal volume of concentrated nitric acid. The reaction is very violent, red fumes are evolved, heat is generated, and at the conclusion of the reaction nothing remains in the vessel but cotton, the alcohol and ether being totally destroyed or evaporated. The cotton, which now apparently possesses a fibre, is not only not explosive, but is almost totally incombustible, its character having been totally changed during the experiment.—*Scientific American.*

Waterproof Cement.—The following is a valuable cement which, if properly applied, will be insoluble even in boiling water. Gelatine, five parts; solution of acid chromate of lime, one part. Cover the broken edges with this, press lightly together, and expose to sunlight, the effect of the latter being to render the compound insoluble.

Cement for Leather.—A cement which has been found useful for this purpose may be prepared by mixing ten parts of bisulphide of carbon, one of oil of turpentine, and so much gutta-percha as is necessary to produce a thick fluid. The leather must be first freed from all grease, which can be done by simply laying it in a cloth and pressing this with a hot iron. The parts to be joined, after being brought into contact with the cement, require to be kept pressed together until they are quite dry. Another: Put equal quantities of ordinary glue and isinglass into a cauldron, and pour on them water enough to cover them. Let them stand in this state for ten hours, till they are thoroughly soaked. Then heat to boiling, and add pure tannin till the mixture assumes the appearance of white of egg. After the hair-side of the leather, which serves as a surface for the cement, has been sufficiently smoothed, apply the cement while warm, and rub the surfaces to be joined firmly together, and leave them for several hours to dry. If the cement is properly made, no further joining (by riveting, &c.) will be required, as the cement exhibits almost the same character as the leather itself.—*English Mechanic.*

To Correspondents.

The Edinburgh Photographic Exhibition.—We regret that the feeling generated by the medal discussion in the Edinburgh Society still prevails. Mr. W. T. Bashford writes a caustic note in reference to Mr. Neilson's letter in our last, and asks us, in order that Mr. Neilson may not remain under a misconception, to publish in full the telegraphic message he sent in reference to Mr. Williams's absence from home on the 2nd of August. We regret that we are not in a position to do this, having forwarded it, to the Editor of another journal, in accordance with instructions and retained no copy. We wish we could induce our Edinburgh friends now to bury the hatchet, and jointly devote that surplus energy which makes them hard hitters, to effort on behalf of the coming Exhibition, which none of them can, for his own self-respect's sake, permit to be a failure.

A. Z.—The late hot weather has doubtless had a tendency to produce fog, and under such conditions special care should be taken to avoid it. The silver bath may be made slightly weaker. The iron developer may be made weaker, and an additional proportion of acetic acid added. The fog which occurs during intensification may be due to various causes; but our correspondent does not give us sufficient data to say which cause is in operation in his case. Does he intensify before or after fixing? Does he use iron or pyrogallic solutions? In any case he will find the following plan aid him. Before applying the intensifier, pour over the plate a solution containing one grain of iodine and two grains of iodide of potassium in an ounce of water; let this remain on the plate for about half a minute; then pour it away, wash well, and apply the intensifier.

Charhon.—The "smokiness" of which you complain in ferrotypes is doubtless fog, probably caused by too prolonged development. The development of the ferrotype requires treatment different to that required by a negative. The developer should contain a larger proportion of acid, about a couple of drops of nitric acid and fifteen drops of acetic acid to an ounce of 15-grain iron solution, and the development should not be prolonged beyond a few seconds. We never saw any salt of any kind crystallize on the surface after fixing and well washing, nor do we see how such a thing should occur. 2. It is possible to dry ferrotypes by means of a spirit lamp, if care be used. 3. We believe Mr. Atkinson, of Liverpool, will supply the Alba plates. 4. The ordinary ferrotype plates cannot be used for printing with collodio-chloride of silver. 5. Various attempts have been made to secure half-tone in photo-engraved copper plates. Mr. Woodbury has been one of the most successful.

M. F.—The flat dull appearance of your prints may be due to several causes, such as a weak negative, weak silver bath, unsuitable paper, &c.; but we strongly suspect it is due to using the sensitive paper in too dry a state. Of course it should be dry, in the ordinary sense of the word, when placed in contact with the negative; but if it is perfectly desiccated, or "bone dry," it is apt to print weak, poor, and flat. The remedy is obvious.

R. G.—We do not know of any one who gives lessons in producing lantern slides. Possibly some one, like Mr. F. York, of Lancaster Road, Notting Hill, who is engaged in such work professionally, may be willing to teach.

An Amateur.—There should be no difficulty in procuring filtering paper free from iron; failing such, however, cotton wool will answer. 2. We have never seen a black precipitate at the bottom of a collodion bottle, nor in the ordinary constitution of collodions ought such a precipitate to occur. 3. Such pinholes as you describe doubtless arise from supersaturation of the bath with iodo-nitrate of silver. It will frequently happen that a bath will work clean early in the day, and, gradually accumulating the iodide during the day, give pinholes in the afternoon, especially on a warm day. Such a bath should be treated as we have often described for excess of iodide. Nitrate of baryta has been found by many a cure for pinholes. From three to five grains per ounce may be added. If a bath be kept covered up, it should not often require filtering. It is a good thing to use a dipper upon which the plate rests at a distance from the bottom, so that the sediment, if stirred up, does not affect the plate.

A Constant Subscriber.—The "Reflectoscope" is an enlarging instrument in which an enlarged negative can be produced direct from a paper print. The print is placed so that the light from a flame of any strong actinic artificial light shall be reflected on it from a series of concave mirrors, and the image then received by the enlarging lens. The invention is, beyond a question, very ingenious, but as to its practical value we cannot speak. Our impression is that better results would be obtained by enlarging from a transparency in the way now most usually practised.

Gala.—The best way to strengthen an acetate of gold bath is to add fresh solution made as at first, with the exception of the proportion of water, which need not be more than one-third of the original quantity. 2. The toning bath will discolour from many causes; but these are of two kinds, both producing a decomposing or reducing agency. Light will often reduce the gold present, and the bath will become purple. Dirty fingers will decompose it, especially if they have touched hypo, or sulphate of iron. 3. It is not only desirable, but imperative, that the bath should be clean and clear. 4. Cleanliness and shielding from light will keep it so. 5. The waxing solution is, we believe, safest. 6. Prints properly produced and properly mounted neither curl nor lose their gloss. 7. Bigelow's Album is published in America, and the English publishers are dependent upon the American producers for being able to keep stock in hand. It has recently, we understand, been reprinted. It is expected shortly.

B. A.—You must be proposed and seconded, and your application having passed the council, you will be duly balloted for in the meeting. If you become a member, as soon as the session commences you will pay one guinea entrance fee and half a guinea subscription, the annual subscription of a guinea being due in January. We will propose you, if you wish.

R. Parr.—You will not be able to combine in one lens all the best qualities for portraiture and for landscape; but if you want it chiefly for portraiture and occasional landscape, No. 1 will answer well. If chiefly for landscape, and occasionally for portraiture, No. 2 will be best. Both are capital lenses. 2. We have had no experience in the manufacture of gelatine pellicle; but should imagine that if the attempt were made to strip it from the dish before it was quite desiccated, there would be no difficulty.

Egerton.—The best mode of toning opal pictures is by means of a neutral solution of chloride of gold, about two grains to the ounce. 2. Nitrate of baryta from three to five grains per ounce of silver solution. 3. There is no advantage in adding chloride of calcium, except in special circumstances.

J. Stephens.—Thanks. We will attend to the matter in time.

J. H. W.—Many thanks for the Chillon prints, and other interesting views. Also many thanks for the interesting details of exposure experiments. The two examples are singularly near alike in exposure; possibly the coffee plate would have done with a second or two less, to be precisely equal to the wet plate. We shall publish the details in our next.

Dr. Phipson.—Thanks. We will forward the pamphlet to our contributor.

Received.—The "Stenograph Manual;" Mr. Hughes' "Practical Photography," eleventh edition; "Enamelling and Retouching," by P. Piquepe.

Several Correspondents in our next.

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METEOROLOGICAL REPORT FOR JULY.

BY WILLIAM HENRY WATSON, F.C.S., .M.S.

Observations taken at Braystones, near Whitehaven,
36 *feet above sea-level.*

N.B. The readings of the barometer given in this and former reports have not been reduced to sea-level. The readings of the thermometer were made in the shade.

Date.	Barometric Pressure.			Temperature			Direction of Wind at 9 a.m.	Remarks.
	Morning	Noon.	Night.	Morning	Noon.	Night.		
1	29·57	29·60	29·60	60°	62°	61°	—	A little rain this afternoon
2	29·64	29·70	29·80	60	66	56	—	Rain a.m. Gloomy all day.
3	29·88	29·83	29·70	57	70	62	—	Fair, but gloomy
4	29·75	29·76	29·70	59	67	59	—	Fair and sunny
5	29·57	29·54	29·71	60	71	59	—	A little rain morn. and afternoon
6	29·73	29·70	29·59	56	70	62	—	Fair and sunny
7	29·50	29·51	29·40	60	68	62	—	Fair and sunny
8	29·40	29·52	29·60	60	67	60	—	Fair, but gloomy
9	29·60	29·60	29·62	62	70	58	—	A little rain a.m. and p.m.
10	29·60	29·70	29·73	62	68	60	—	Fair and sunny
11	29·91	29·99	30·00	61	62	59	—	Fair, but cloudy
12	30·10	30·11	30·11	58	62	60	—	Fair and sunny
13	30·11	30·13	30·14	62	65	62	—	Showers p.m.
14	30·15	30·17	30·18	62	71	63	—	Fair and sunny
15	30·20	30·20	30·19	70	78	64	—	Fair and sunny
16	30·16	30·14	30·10	74	79	66	—	Fair and sunny
17	30·14	30·17	30·17	64	65	56	—	Fair and sunny. Windy
18	30·11	30·10	29·99	66	63	61	—	Gloomy all day. Rain at night
19	30·00	30·05	30·09	64	66	60	—	Fair and sunny
20	30·09	—	30·09	62·5	64	54	—	Fair and sunny
21	30·10	30·00	29·92	64	73	63	—	Fair and sunny
22	29·89	29·89	29·89	67	74	57·5	—	Fair, generally sunny
23	29·89	29·90	29·92	63	71	59	—	Fair and sunny
24	29·97	30·00	30·07	62·5	66	56·5	—	Fair and sunny
25	30·07	30·01	29·92	62	66	62	—	Rain at night
26	29·80	29·76	29·72	62	63	56	—	Rain p.m.
27	29·89	—	29·78	55	—	55·5	—	Fair and sunny
28	29·48	29·48	29·45	54	56	58	—	Fair and sunny. Windy
29	29·50	29·64	29·73	60·5	64	59	—	Fair, occasionally sunny
30	29·73	29·73	29·72	61	70	62	—	Fair, but gloomy. Very windy
31	29·46	29·48	29·53	60	63	53	—	Rain with thunder and lightning at night. Windy all day

Summary.

	Mornings.	Noons.	Nights.
Maximum temperature observed	74°	79°	66°
Minimum ditto	54	56	54
Mean ditto	61·6	67·3	59·5

Mean of all observations	62·8
Number of fair days	22
Number of days on which rain fell	9
Number of fair days sunny	18
Number of fair days gloomy	4

Notes.—From the foregoing it will be seen that the highest temperature recorded during the month was 79°—a temperature 5° higher than recorded here in July last year. The extraordinary heat recorded in many parts of England we seem, however, to have escaped; on every side, indeed, it appears to have been much warmer. Mr. J. D. Watson, at Bolton-le-Moors, registered the temperature in the shade at noon on Sunday, the 16th, at 90°—a difference of 11° between the temperature there and here.

Braystones, near Whitehaven, August 10, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PORTRAIT PAINTING AND PORTRAIT PHOTOGRAPHY—HOW TO UTILISE CRACKED PORCELAIN.

Portrait Painting and Portrait Photography.—"Photographers are no artists," is an expression that is often heard. Persons who have some pretensions to art knowledge, whether as painters, or as critics, are at times very severe upon the humble efforts of the photographer, and will glance through a portfolio of work produced with the camera, with that cool supercilious contempt which only a knowledge of one's own tremendous capabilities can call up. Now we are not going to justify the work of photographers, or declare that they know as much about art as most painters, for we do not wish to make ourselves ridiculous; but we do say this, that strictures passed upon photographs by men even who have won a position for themselves as painters of portraits and landscapes must not always be taken by photographers as just and equitable, for the simple reason that these gentlemen are by no means agreed among themselves, either in respect to words or deeds, as to what is good art. Photographers should always remember this. Because a man who can paint, and exhibits in the Royal Academy, says a word in praise or blame, it does not follow that his opinion is valuable simply because he makes pictures that sell. Photographers are very apt to reason thus, and to bow down to all who make a livelihood by brush and canvas. If this view of things were correct, every photographer who makes a good income by his works must be an artist also. There are, we know, many men in the ranks of photographers who have done very good work with the pencil and the brush—work that has been acknowledged by its reception at the Royal Academy and other firstrate galleries—and thus hold rank as painters; but this has little to do with what we are discussing. We repeat that photographers should not be too ready to take the dictum of a painter, and for the sole reason that he is very often a prejudiced man—not only prejudiced against the photographer, but also against his own fellows. If you hear photographers decried for lack of art, so also you hear painters of standing placed in the same category. "Mahlstick is clever with his brush, and paints pictures that go down with the public, but he is no artist," is an opinion frequently expressed by Mahlstick's brethren; while of McGilp they say, "He hits the popular cup-and-saucer style, but there is no true art about his works." We do not say that these criticisms about Mahlstick and McGilp are unjust and uncharitable, but nevertheless they are applied to men who paint what to many people appear charming pictures enough. But let us now come to the works of painters who exhibit at our annual exhibitions, at the Academy, and elsewhere. This year we were fortunate enough to get an opportunity of visiting three large national collections, within a few days of each other—namely, the Royal Academy in London, the *Salon* in Paris, and the *Kunstausstellung* in Munich; and we made it our special study to examine those most uninteresting of pictures—the portraits. We did this with a view of comparing the poses which painters had given their models, with those which British and foreign photographers of the first class adopt. Indeed, one of our objects in making the study was to pick up some good poses such as might be suitable in photography. The result was profoundly disappointing, and indeed any one who will call up in his mind—and he can readily do so, if he made a careful survey of the Academy—the display of portraits, will at once agree that from most of them the photographer could learn little in the matter of posing his sitters. In the Royal Academy there were scarcely a score of happy poses among the portraits, and at Munich there might have been the same number; at Paris matters were a little better, but here even the greater majority of persons represented were depicted in anything but graceful and easy attitudes. Many of the portraits and groups—we are not criticising the likenesses, be it remembered—were so stilted and meaningless in attitude, that they might have been sketched for a fashion book, only that one generally sees smarter clothes in plates of this kind. And this opinion is borne out very generally by our critics, who seem never tired of deprecating the portrait work. If, then, such mediocre posing is admitted to these salons, and this branch of the art is avowedly so difficult to execute, why are people so hard upon the photographers? If an artist wants to paint a portrait in the easiest fashion, he merely shows the head, or at most the head and bust; and photographers, too, are well aware that the most lamentable portrait will frequently look well if you take but the head alone. But this is simply begging the question, for a photographer knows very well that if he has only a head to take, the task of posing is reduced to a minimum. In Paris, we noted for ourselves half a dozen charming poses, and if we had but time we might have secured a goodly number that would have been useful to the photographer; but, as we said before, most of them were best left alone. In saying this, we do not for a moment wish to place photographers on a level with the painter, neither do we wish photographers to think that they do not already enjoy their proper status; but we desire to point out to them that because a man can work upon canvas or paper, he is not necessarily a sound judge of art matters, but that, through prejudice or incompetency, his opinion is not better than that of others. It may not follow that because painters do not succeed in giving a happy pose to their portraits that photographers are on this account equal to them in art capacity, but it certainly does follow that if the former do not succeed in their work any better than some of the portraits painted by them demonstrate, they have not made good their title to be considered competent critics on art matters.

How to Utilise Cracked Porcelain.—Photographers will be glad to hear how they may be able to use their cracked porcelain dishes. It will not do to have them rivetted with a strange metal, unless they are to be employed for ordinary purposes where no chemical action is set up, and hence, as a rule, broken utensils in the laboratory are thrown away. In the *Journal of the Chemical Society*, Mr. A. Starling gives a method of stopping with a cement which is so good, it is said, that it will defy even the action of a steam bath for a long time. The cement in question is a simple mixture of chalk and linseed oil, which is applied in a layer over the cracks, and the utensil is then pressed close together. The cement takes some time to become fast, and a month or two should elapse before the utensil is again employed. After this period, however, it may be used for many purposes, and, as we have already stated, it will bear steam heat for some time. We do not suppose that the cement would do of itself for fractured porcelain, for the aim of the inventor seems rather to prevent anything from entering the fissure, and then to hinder it from becoming bigger.

PHOTOGRAPHY IN CONNECTION WITH THE OBSERVATION OF THE TRANSIT OF VENUS AT ROORKEE.

BY CAPT. J. WATERHOUSE, ASSISTANT SURVEYOR-GENERAL OF INDIA.[*]

THE collodion used was prepared according to a formula given me by Colonel Tennant as follows:—

Cadmium iodide	1 gramme
Cadmium bromide	1 „
Ammonium iodide	1 „
Pyroxyline	4 „
Ether	110 cub. cents.
Alcohol	110 „

This collodion contained a large proportion of pyroxyline and haloid salts, and was selected because it was found to give more density of the film and intensity of image than the ordinary commercial samples. Two pints of it were carefully cleared for use during the Transit.

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[*] Continued from page 400.

A reserve supply of a mixture of Thomas' and Rouch's was also used for some of the plates. It was arranged that the collodion should only be used once, so that each plate might be coated with fresh collodion, thus preserving the uniformity of the films and keeping the collodion free from impurities.

An ample supply of developer was also prepared by the following formula:—

Protosulphate of iron	55 grammes
Sugar	55 "
Glacial acetic acid	40 cub. cents.
Spirits of wine	30 "
Water	1000 "

A solution of cyanide of potassium was used for fixing.

It was considered advisable not to intensify the plates, but to obtain the greatest possible intensity from the first development.

As the plates were developed they were placed in a draining rack in order as taken, and put aside till after the Transit.

The distribution of duties were arranged as follows:—

I remained at the photo-heliograph to expose the plates at every two minutes and record the times of exposing each plate by the clock dial, which had previously been ascertained to agree with the standard clock, carefully noting any variation in the intervals, and any other noteworthy circumstance connected with any of the plates. At every sixth plate, with a few exceptions, the cross-wires were replaced by the reticule.

Sergt. Harrold developed the plates and generally supervised the operations in the dark room. He was directed to take special care that the plates were arranged in the racks in their proper order of sequence as developed, and to note in writing any variations. He was at once to inform me of any defects in exposure or in the position of the image on the plate.

Corporal George coated the plates with collodion and sensitized them. He was responsible that the plates were taken in the proper order, as numbered and arranged in the boxes, and was ordered to at once report any change. In case of having to pass over any of the marked and numbered plates, he was to properly number the plates substituted for them. In order that the position of the sun's image might be the same on all the plates, he was ordered, when coating the plates with collodion, to keep the unnumbered side of the plate uppermost, with the numbered corner away from him on his right hand, pouring off the collodion at the near right-hand corner.

Private Fox took the plates out of the baths and placed them in the slide, so that the numbers might be at the upper left-hand corner of the slides, and the thick collodion at the lower left-hand corner. (This arrangement of the plates, when being coated and placed in the slides, was observed throughout all drills and practice plates, and answered the purpose perfectly.) He then placed the dark slides in the receptacle in the door, from which they were passed into the dome by the man in the passage between the doors. It was also his duty to carry the Janssen slide into the dome, place on and take off the No. 1 counterpoise, which was fixed at the end of the declination axis, and carry the Janssen plates back again for development. In case of there being any delay in a wet plate being ready at the proper time, he was to keep a dry plate in readiness to be sent in instead, notifying the change, and this he was ordered to do at all changes from wet to dry, and *vice versa*.

In order to prevent mistakes and confusion in communicating between the dome and dark room, it was arranged that all communications should be in writing; supplies of slips of paper with a pencil attached were kept in a convenient position in different parts of the dark room and the dome, and were passed to and fro through the slides in the doors without noise or disturbance of the operations.

Of the three native servants, one remained in the dark room to hand the dark slides backwards and forwards, but when the Janssen slide was used he went into the dome to put on the No. 2 counterpoise, at the object glass end of the telescope; another man remained in the space between the double doors, and passed the dark slides in and out through the slides in the doors. The third stood in the dome to hand me the dark slides, hold the loops of thread and hook them on the string attached to the exposing shutter, turn the dome, and give me any other assistance I required.

Corporal George and Private Fox took it in turns to act as orderly of the week, and their duties were to open the dome for work, have the water boxes filled at the proper times, uncover the instrument, see that the necessary chemicals and glasses were ready in their places for use, and after work to have the rooms cleaned, the instrument dusted, and the dome closed.

Two or three days before the transit I examined all the adjustments of the sliding shutters and the electrical communications, and satisfied myself that all were in good order.

As the weather had been cloudy two or three days before the transit there was some uncertainty as to whether it would be fine or not, but, in the event of its turning out cloudy, I had arranged that the whole operations were to be gone through just as for a drill, so that we should have been in a position to take immediate advantage of any break in the clouds, discretion being of course exercised in altering the uniformity of the intervals between the plates, in order to take advantage of any passing gleam of clear sunshine. Fortunately it was fine, and this precaution was not required, but I am sure that it was the only way of making certain of being ready at a moment's notice had the sky been cloudy.

(*To be continued.*)

THE OPTICS OF PHOTOGRAPHY.

BY PRESIDENT HENRY MORTON.*

The material universe forms one vast system, a whole, in which no part can exist in a state of isolation from the rest. It is impossible to bring any influence to bear upon one of them without affecting everything else. When Newton saw the apple fall, the train of thought suggested to his mind began its effect upon the thought of all succeeding time; while the change produced in the earth's centre of gravity by the change of the apple's position affected not only the planets on the very outskirts of our system, but even the remotest of the fixed stars. So also every branch of physical science necessarily affects every other branch, insomuch that it is impossible to study one and exclude the rest. We cannot become proficient in physics without a knowledge of chemistry, nor in chemistry without a knowledge of physics. All sciences are mutually indebted to each other, and all profit by discoveries in any one of them.

In the subject of the present lecture we have an example of the inter-dependence of optics and chemistry. Photography owes, perhaps, its origin to the science of optics; but it soon made good its indebtedness by originating, in its turn, considerable advances in practical optics.

In the latter half of the fifteenth century the camera-obscura was invented by Baptista Porta, and certainly no one who ever beheld the image produced in this well-known instrument could help a feeling of regret that it was not permanent, and a desire to make it so. Thus did the invention of this optical instrument give the first impulse in the direction of photography.

When Daguerre had solved the problem of fixing the image of the camera-obscura, his chemical discovery immediately reacted upon optical science. Chemistry called upon optics for the means of producing an image so accurate and perfect in all respects as to be worthy of that permanence, of that immortality which she could confer. This was the great problem in practical optics of the day, as will be readily conceded after an explanation of what was required, what were the difficulties, and how thoroughly they have been vanquished. This problem and its solution originated and now constitutes the science of photographic optics or the optics of photography.

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* **Lecture delivered at the Steven's Institute of Technology, and reported in *Scientific American*.**

To obtain a proper appreciation of the question, it will be well to begin at the very beginning. When a ray of light passes from a rarer to a denser medium—as, for example, from air into glass—its course is changed by being bent towards the line perpendicular to the entering surface. On passing from glass into air, it is bent in the opposite direction. In Fig. 1 the upper half of the circle, above X Y, is a rarer, and the lower half a denser medium. The ray A B is bent in the direction B G. The amount of this bending or refraction varies with the nature of the substances employed, and is found by dividing the sine of the angle of incidence by the sine of the angle of refraction. In Fig. 2, let Q G be a bar of glass; then the ray O P will be deflected on entering the prism by being bent towards the perpendicular; while, on leaving it again and passing into the air, it will be bent as much away from the perpendicular, and will consequently emerge parallel to its original direction.

Fig. 1.

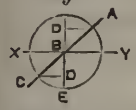
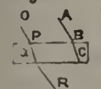
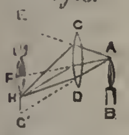


Fig. 2.



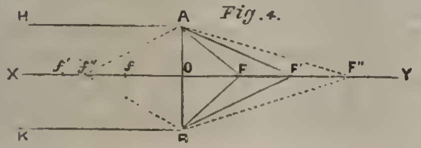
This principle was beautifully shown by projecting an arrow on the screen, and then interposing a bar of glass between a part of it and the rays. The result was that, where the rays were intercepted by the glass, the arrow was broken, and the broken piece stood either above or below the rest, according to the inclination of the glass. Now, if the intercepting glass is made in the form of a lens, all the rays striking it from any one luminous point will be refracted to a point on the other side of the lens, because it is made up of a number of prisms, the angles of whose surfaces grow more acute as we pass from the centre to the ends, C and D, Fig. 3. In this figure we have three out of many rays striking the lens from A; by carefully constructing the passage of these rays it is found that they will all meet in the point H. The same can be shown with any other point of the candle, A B; so that if a screen were placed at E G, we would obtain a reversed image of the candle.

Fig. 3.



Passing now from this general statement to the principles involved, we find that parallel rays falling on an ordinary glass lens having both surfaces of the same curvature will meet in the centre of the curvature on the other side of the lens. Thus, in Fig. 4, the ray H A K B, will be refracted to the point F. The same would be true for any other parallel rays not drawn in the figure, because they would be acted on equally by the opposite surfaces of the lens; and they would be bent less and less the more we approached the middle of the lens, because the angle decreases more and more. The point F is called the focus, a word meaning fireplace. Conversely, all rays starting from F would emerge parallel on the other side of the lens.

Fig. 4.

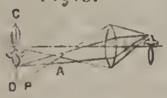


If, now, we suppose the lens split in half in the direction, A O B, and one half removed, its converging power would evidently be reduced one half; in other words, the focus will be twice as far off, and the rays H A, K B, will now be bent only to F'. Conversely, rays starting from F' will emerge parallel. Now, if we put the other half of the lens on again, rays starting from F' will converge at f', just as far on the other side of the lens. It is evident, moreover, that the further the source of rays is removed from F' in the direction F'' Y, the less their divergence, and the easier it is for the lens to make them converge on the other side. Hence, the further we put the source of light from the lens on one side, the nearer the lens will its rays be brought to a focus on the other side. Thus, the point F'' corresponds to f''. Conversely, rays proceeding from f'' will diverge so much that the lens can bring them to a focus only at F''. Two points having such relations to each other are called conjugate foci.

To illustrate this, the lecturer had a lens and a burning candle on the stage. Placing the candle at a proper distance from the lens, an image of it was produced on the screen. When the candle was then brought nearer the lens, it was found necessary to move the lens further from the screen to get an image; and when the candle was further removed from the lens, the latter had to be placed near the screen. It was also observed that, the nearer the candle was to the lens, the larger the image produced.

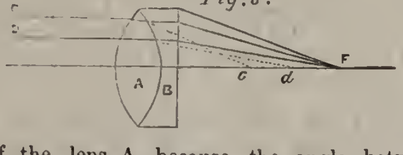
Unfortunately it is impossible, even with the most skilful workmanship, to construct spherical lenses, which bring objects to a perfectly sharp focus. This is especially the case with large lenses. Thus, rays coming from the bottom of the inverted object, in Fig. 5, will not all meet in the same point. Those passing through points near the centre will meet at D; those passing through the ends will come to A; and intermediate rays will assume positions between these two points, so that a blurred image results. This error is called spherical aberration.

Fig. 5.



The defect is corrected by joining to our double convex lens another having one surface concave and the other plane, as in Fig. 6. The refraction is greatest near the points of the lens A, because the angle between its two surfaces is greatest there; on adding the lens B, however, which acts in the contrary direction, the rays are lifted up most near the ends of the lens, just where they need it most, and a compensation is thus effected. By the use of the lens A alone the ray C would pass to *c*, and the ray D to *d*; on adding the lens B, however, both will converge at F.

Fig. 6.



To be continued.

THE ANALOGY OF SOUND AND LIGHT.

The Saturday evening free lecture in connection with the Loan Collection of Scientific Apparatus at South Kensington was given by Professor Barrett, M.R.I.A., of the Royal College of Science, Dublin, on "Some Experiments Illustrating the Analogy of Light and Sound." Major Festing, R.E., took the chair.

The Professor commenced by referring to some of the well-known facts about light and sound, such as that sound waves travel through air, while light waves travel through "luminiferous ether," &c. Among many illustrations of the rate at which each travels, he gave this as a very intelligible one:—If a cannon were fired in London the sound would take about eight minutes to travel to Birmingham, a little over 100 miles, while in the same time the light from the flash would have travelled to the Sun, a distance over 90 millions of miles. But though they so differ in the rate of progress, both light and sound show many phenomena in common. In the experiments made during the evening the sensitive flame was used as a detector of sound. This delicate acoustic re-agent, familiar to London audiences through Professor Tyndall's lectures, was first, we believe, discovered in 1866 by Professor Barrett, though he modestly did not allude to the fact. Indeed, most of the experiments shown during the evening formed the subject of a paper read by him before the Royal Dublin Society, in January, 1868, and the discovery of the ratios referred to at the end of the lecture was announced in the *Quarterly Journal of Science* for 1870. The performance of the experiments, however, was entirely new to a London audience. The analysis of the phenomena of light and sound were illustrated in the following order:—1. Both light and sound get feebler as they leave their source of origin. In the case of sound this was shown with a loud ticking watch and a sensitive flame. 2. In reflection the angle of incidence is the same as the angle of reflection. In the case of sound this was shown with the sound of a whistle sent along a tube, and reflecting along another placed at an angle to it from a reflector placed at the end where they approached. The distance to which a feeble sound might be reflected perceptibly from a concave mirror was shown with mirrors over thirty feet apart. 3. With refraction, in the case of light, familiar convex lenses were used, and in the case of sound, analogous but less familiar lenses of gas of a different density from air were used. A collodion balloon, filled with carbonic acid gas, served as a double convex lens, and its action was manifested by the concentration of sound from the ticking watch on to the sensitive flame. 4. Both light and sound suffer absorption in passing thorough non-homogeneous media. Professor Tyndall's apparatus, showing the "echoing back" of sound in passing through successive alternating layers of gas of different densities, is now well known, and every one is familiar with the fact that though light may traverse a vessel of clear water, it can no longer travel when it is filled with bubbles of transparent air. 5. There is an analogy between the sympathy among the same notes of a gamut and the sympathy among individual colours in the spectrum. An incandescent body that produces a particular bright band in the rear of the spectrum will, when in a gaseous state, absorb light, and cause a dark band in exactly the same part of the scale. Tuning forks, wires, or columns of air in jars are responsive to vibrations produced by others exactly in unison, but only to those. This was shown in various ways in a very clear manner. 6. An analogy, which Professor Barrett called a more fanciful one, was spoken of. All the complex music of an orchestra is the result of a few simple notes variously combined. So all the tints of a picture are the results of a few simple colours variously combined. The musical scale sorts the complex notes in one case, the spectrum sorts the complex colours in the other. Professor Barrett, taking Professor Listing's determination of wave lengths, has made a most interesting comparison. The wave lengths of the notes of the gamut he expresses not in absolute but in relative measurement. Thus C is taken as 100, and all the other notes have their wave lengths expressed in percentages. Similarly, red is taken at 100, and the wave lengths of other colours are expressed in percentages. This interesting result comes out in comparing the two columns. O and orange are each 89; E and yellow, 80; F and green, 75; G and the average of the blues, 67; A and violet, 60; B and ultra-violet, 53; C and the obscure rays (black), 54. Further, the comparison of harmonies comes out in an interesting manner. Low C and upper C sound well together, so red and black go well together. Red and green, and C and F, harmonize well; but red and orange no lady would wear, and C and O make a combination by no means pleasant. Red and blue, or C and G, also go well together. 7. The concluding part of the lecture was devoted to an illustration of the figures described by vibrating bodies. Several apparatus for this purpose were briefly referred to, but especial attention was given to an apparatus of great ingenuity devised by Mr. S. F. Pichler. It is exhibited in the west gallery, No 7,596. Professor Barrett showed it with an electric light and a reflection on to a screen. The principle of it may be thus described:—Two metallic vibrators, each with a small speculum, are fixed at right angles to each other, and sounds are produced by a current of air acting on one or both of them at pleasure. The perpendicular vibrator is tuned to a given note; the horizontal vibrator is fitted with a mechanical arrangement whereby its pitch can be graduated to any degree of nicety within the compass of two octaves. An apparatus is also provided whereby a pencil of light is concentrated upon the speculum of the perpendicular vibrator, whence it is reflected to the speculum of the horizontal vibrator. For lecture purposes artificial light is used, which is further reflected and magnified upon a screen. When musical sounds are produced by the vibrators, various luminous geometrical figures are formed on the horizontal speculum and reflected on the screen by the single or joint action of the vibrators described by the pencil of light; and the form and motion of such figures demonstrate the exact relations to each other of the musical notes produced. Sounds which harmonise to the ear produce regular figures to the eye, as, for example, segments of the circle, ellipses, ovals, circles, or straight lines; and if the amplitude of each vibrator be equal, these luminous figures will hover, on the speculum or screen, with an apparent steadiness like that of the heavenly bodies hovering in the sky. If the sounds do not harmonize, the figures are confused, unsteady, and complicated, presenting an appearance as if the wave lines were contending with each other. The mathematical relations of musical notes are also demonstrated, regular simple forms being produced by combination of those notes which result from vibrations bearing a definite numerical ratio to each other, while irregular and unsteady figures are caused by notes which have no such ratios. The pattern made on the screen by a discord is very bewildering to the eye.

Professor Barrett, in concluding, said, after seeing how musical notes may be translated into moving lines of light, the words put by our poet into the mouth of Lorenzo have additional interest:—

> "There's not the smallest orb which thou behold'st
> But in his motion like an angel sings."

Major Festing conveyed the thanks of the audience to Professor Barrett.—*Times*.

PHOTOGRAPHIC BACKGROUNDS.

BY HANS HARTMANN.[*]

If it is desired to paint lines or partitions upon a background, the measurements are first accurately noted, and then the lines are put in by means of a piece of string blackened with soot or powdered charcoal. The string is held taut across the background in the proper place, and then drawn forward by the fingers; if let go suddenly it then marks a black line. In this way any mistake that is made is easily remedied by brushing off the particles of black.

To ornament a division or field, you take a sheet of paper of the same size. You bend the paper in two and sketch upon one half any figure that may seem desirable, the bend of the paper being the middle. The paper is then doubled, and the outline of the design pricked through with a needle. On opening the paper again, the half of the design that has been sketched in will be found printed off on the other side, and in this way the whole design is formed. Square designs, rosettes and the like, are produced by folding the design paper in four; the angle is taken as the centre, and then by printing off a double symmetrical figure is secured. After pricking the design, it is placed upon the background in its proper place, and then by means of a pad containing finely powdered charcoal or soot, which is dabbed all over, the design is traced by dust upon the background. It is then easy enough to complete with the brush. As the background is, as a rule, not sharply focussed, no great accuracy is required in its design; the great thing is to have it of the proper colour.

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[*] Continued from page 392.

Very good designs are to be found in the trade journals, and are to be had of the paper-hanger and decorator.

The painting materials in the case of distemper work are obtained at a very reasonable cost. A few pipkins, a rule, a line, and some suitable brushes are all that is necessary. The latter, unfortunately, are sometimes not to be had of very good quality; they should be large and long in the bristles. Fine hair brushes are not to be recommended for distemper work. For putting in fine lines, there are suitable sash tools of a long thin character.

The advantages of distemper—its great cheapness, uniformity, and, above all, its absence of gloss—render this class of work especially suitable for backgrounds which are not exposed to wet, rough usage, and the like. If it is a question, however, of painting furniture, columns, balustrades, and similar objects, then a wax colour is preferable. This will bear wet to a certain extent, may also be applied very evenly, and has the advantage of no brilliancy, as is the case with distemper.

In mixing wax colours no levigated chalk is employed, and, instead, zinc or lead white is used ground in oil or finely powdered. Neither must Cassel Brown be employed. Instead of this lamp-black, burnt dark ochre, or burnt English umber is used. The binding material is wax and gum mastic in equal parts, melted together in turpentine over a mild fire. The greatest care is necessary in this operation, as the compound is easily set on fire. To this mixture may be added a small quantity of Copaiba Balsam. If it is desired to dilute this mixture, a little wax emulsion in turpentine is added.

To apply this colour to large surfaces, of linen, the latter must first of all be coated with a mixture of chalk and linseed oil varnish, and thoroughly dried. Upon wood, stucco, metal, porcelain, &c., the colour may be applied at once. By gentle brushing it is possible to impart to it every degree of brilliancy. When the surface appears too glaring, the application of turpentine is sufficient to rob it of all its gloss.

The method is a little more costly, and is not so easy to carry out; but the result is more durable, and any kind of background may be treated.

If it is desired to impart gloss to the object, linseed oil varnish should be used, instead of the wax solution. Oil colour may be dulled very effectively by means of turpentine or a thin coating of wax.

Vases, boxes, and other properties may be covered with gold bronze, which, when mixed with gum water, is easily applied. In this way very suitable ornaments for the studio may be secured. A simple wood case, nicely painted and furnished with a pretty ornament, will come out very well in a picture.

Finally, upon paper backgrounds you may paint very well with water colours. A piece of sepia-honey pigment, which costs but a halfpenny or a penny, is dissolved overnight in a sufficient quantity of water, and this is then applied of a faint tone with a delicate hair brush. One of those flat brushes pinched in tin are the most suitable. The colour is applied until the desired tint has been secured. When dry the work may be gone over a second time, only in that case care must be taken not to come upon half-dry plates, as this will inevitably give rise to patches. While in the case of distemper work it is always well to have the frame hanging up in a perpendicular position when painting, in the case of water colour, where there is not that tendency to the formation of patches, it is better to have the background in a horizontal position.

I would close this communication with the hope that those who have not yet tried their hand upon this branch of the decorative art will be induced to make a few essays upon small objects of which they may stand in need. I am quite sure that they will speedily overcome all difficulties, and will soon be independent of the carpenter or painter for their backgrounds.

LIGHTING AND POSING.

BY CLAY H. GILBERT.[*]

I consider a good light as essential for making good pictures as any other one thing used. Some say, "What if you have a poor light? Make your chemicals do the work." I do not believe it can successfully be done. Light is what makes a picture. I would like to see the best artist of which the world boasts make a picture without light, and he can have all the chemicals that are in use at his command. And we must not only have a good light, but we must know how to use it. You may have ever so good a light, but if you do not use it aright you will not succeed well. I mean here by "good" light, a large, strong one. It is not a bright, dazzling light that is needed, but a soft, mellow one; and reflectors and screens must be used in such a manner as to make it so. If you have a strong side light, the side of the face opposite the light will be shaded—the stronger the light, the heavier the shade.

A noted artist on lighting says that "the shaded side of the face is not in the deep shadow it seems to be, but that the force of contrast causes it to appear so."

I do not understand it in that way. It is in the shadow as much as any object can be in a shadow; light is what makes a shadow. It is as impossible for a shadow to be cast from an object, without light upon that object, as it is to make a picture without light. So if you wish to lighten the shade on the face, cut off your side light with screens; govern your toplight in like manner. In doing this you balance, or make even, your light, as well as soften it.

Artistic posing is something that many photographers come short of as well as artistic lighting. Lighting and posing is the artistic part of photography; all the rest is only the mechanical part, which is easily enough done by any one, but the artistic is acquired only by years of practice and experience, unless one already has the natural taste for it.

There is a certain pose for each individual, in which he looks better than in any other, if we can but find it. Some look better with a full side-view, some three-quarter, and some full front of the face. Most people try too hard for a picture, thereby spoiling all. If many looked at other times as they do when sitting for a portrait, their friends would hardly know them. The fact is, they overdo it. There is generally some staring, unnatural look about the eyes, or some rigidity of the body, that fails to give the desired result wished for by the sitter, as well as by the artist; and this accounts for so many unnatural-looking pictures. We often hear the complaint—"It don't look a bit natural." Why, it looks just as the sitter did when the exposure was made; it could not very well look otherwise. The more careless the position, the more natural the picture. I do not mean by a careless position an awkward one, though I hardly know what to do with an awkward person. I suppose, to get a natural picture, we must give him an awkward position. But all persons are not awkward.

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[*] *Anthony's Bulletin.*

The Photographic News.

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THE BENGAL PHOTOGRAPHIC EXHIBITION.

THE nineteenth annual exhibition of the Bengal Photographic Society is now open, and is, as we learn from the *Calcutta Statesman*, in every way successful and satisfactory. English exhibitors, as usual, seem to take precedence in excellence of all competitors, and many of the pictures which have graced an exhibition in London are now gratifying the visitors to the exhibition in Calcutta. The very large and fine direct pictures of Messrs. Chaffin and Son, of Yeovil, receive merited praise from our Bengal contemporary. Mr. A. Garrett Cocking sends figure studies, which are highly appreciated. In portraiture, Mr. Marshall Wane wins golden opinions as contributing the gems of the exhibition in that department. Mr. R. Faulkner's portraiture is also highly praised. But the English landscapes seem especially to charm the art critic of the *Statesman*, and he entres into minute examination and appreciative praise. Mr. Reuben Mitchell's delicately artistic landscapes, with some of which English photographers have had opportunity of becoming familiar, command especial admiration. The writer says:—"The eye of an artist has been used in the selection of the views, and the hand of a master in the photographic art is evidenced by the manner in which they are taken. No. 54, 'Kilchurn Castle, Sunrise,' is one amongst the best of these. The foreground is in shadow; while outlined against the sunrise stands the castle in the distance; above, breaking away in gloomy masses, are the clouds of a tempestuous night. No. 55, 'At the Upper Falls of the Archy.' This again is a fine subject. A small stream meanders from the distance down to the central foreground, winning its widening way between low ledges of schistose rocks, partly in the light of a bright day, and partly overshadowed with the gloom of a clump of tall, spreading trees to the left. The delicacy of the treatment in the developing of these charming photographs cannot be too highly praised." The landscapes of Messrs. J. and A. Boole are highly praised, as are the studies of Mr. Frank Sutcliffe, his "Wizard's Glen"—"a nook in the deep heart of a wood, where, beneath the branches of great trees, ferns, long grass, and wild flowers, bright with the beams of the sinking sun, abound"—especially touches the heart of a journalist probably writing in a temperature of over ninety degrees in the shade, without a green thing within reach of the weary eyes. Mr. A. Ford Smith, of Llandudno, sends also fine landscapes and interiors. Mr. J. Brier, jun., sends landscapes which are highly praised:—"Old churches, with the mosses and lichens of centuries clinging to them, hoary forest trees, and wild Welsh valley scenery, are the prevailing features of the batch. No. 262, 'Very Calm,' is our favorite. A winding road, which from a distant point comes down to the left foreground, is bounded to the left by receding hills; a solitary tree stands against the hill-side, while a still sheet of water in the middle distance is skirted by clumps of low trees, and reflects the motionless sky and clouds above." This is the *Statesman's* description. Capt. Abney's Egyptian views, and the studies of his School of Photographic Engineers at Chatham, are ranked amongst the best of the contributions. No announcement is yet made of the medals; but we hope to return to the subject shortly.

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THE SCENOGRAPH.

WE remember, a year or two ago, reading a short paragraph in a Belgian journal, stating that Dr. Candezzi had invented a small photographic apparatus, which he styled a "scenograph," capable of producing wonderful effects, the whole consisting of a camera the size of an opera glass, and a walking stick. Brief as was the paragraph, it had an air of exaggeration which deprived it of authority. We are indebted, however, to the ingenuity and enterprize of Mr. Woodbury for an illustration of the fact that the scenograph mentioned in our Belgian contemporary actually realizes its description. From a little pamphlet called the "Scenograph Manual," just issued by Mr. Woodbury, we learn that the Lilliputian camera is manufactured by the Sciopticon Company, and we learn full details of its construction and capabilities. It is made to take pictures up to six inches and a half by four inches and a quarter, and stereoscopic pictures; only weighs a pound avoirdupois; and is easily carried in a coat pocket, whilst the stand forms a walking stick. In appearance it seems to resemble a stereoscope, with silken collapsible sides. Of course, it is intended for use with dry plates, the emulsion process being recommended, and instructions for working it given in the pamphlet.

An especial feature of the Manual consists in instructions for a mode of transferring the negatives to paper, so as to avoid carrying many plates of glass when on a prolonged tour.

In a recent tour in Italy, Mr. Woodbury informs us that he produced a large number of negatives, with the aid of only half-a-dozen glass plates. The method is described as follows:—

"Lay the negative, when dry, in a basin of water, and at the same time a piece of the transfer paper with the prepared side downwards; in half a minute lift up the glass and paper together, and lay them on a flat surface; remove the surplus water by rubbing over with the squeegee. In the course of half an hour (and while still damp), on applying a knife to one corner the paper will come away, taking with it the negative film. The glass can then be washed ready for use again. When dry, the negatives should be kept in a book of soft paper occupying very little space, and may again be attached to plates of glass on the return home. This is done as follows:—Make a solution of gelatine of the strength of one ounce to ten of water, and add about three grains of chrome alum, dissolve and filter. Coat glasses of same size as the original ones the negatives were taken on. When dry, proceed as before, laying the glass and the picture on the paper in a basin of water, withdrawing them after a space of half a minute has elapsed, and squeezing the surplus water away; allow to dry thoroughly, and then place in a dish of hot water; in a few minutes the paper will come away, leaving the negative attached to the glass as firmly as if it had never been removed. The author can confidently recommend this simple method of doing away with a weight of glass, having first tried it in Italy early this year without having had a single failure. This can rarely be said of any new method tried for the first time, and is a real proof of the thorough practicability of the method employed."

This interesting little pamphlet will interest all landscape photographers.

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A RAPID COFFEE PROCESS.

We recently gave details of a coffee process, furnished to us by an esteemed correspondent in Switzerland—signing "J. H. W."—and we stated at the time that the examples of its working with which we had been favoured ranked amongst the finest landscapes we had seen by any process, dry or wet. Further examples have fully confirmed all we said as to the excellence of the process and the skill and care with which it was worked. In response to the inquiry of one of our readers, our correspondent promised to make some comparative experiments with the wet process in order to test the relative sensitiveness of the plates. We must confess the result has surprised us. Our correspondent says that he finds that in no case, when the conditions are legitimately comparable, does the coffee plate need quite so much as twice the time of exposure required by a wet plate. The exact relation as set down by "J. H. W." gives the dry plate and wet a relation of five to three. As illustrating this he sends a couple of portraits—and we may say, in passing, that portraiture is always a severe test for dry plates—both exposed under similar conditions. The wet plate received an exposure of twelve seconds, and the dry plate twenty seconds. The results are as nearly as possible identical, with, however, a trace of difference in favour of the dry plate. In fact, it appears to us that if the dry plate had received eighteen instead of twenty seconds, the results would have been identical with those of the wet plate. This, we need scarcely say, is a startling result with coffee dry plates, as the process has generally been regarded as simple and safe, but not rapid. Here is a degree of rapidity rarely attained with dry plates, and a degree of excellence which could not well be surpassed. Here is our correspondent's letter:—

"Dear Sir,—In my last communication I stated that I could not reply definitely to your correspondent's inquiry as to the difference of time required for the proper exposure of a dry plate, coffee process, such as I had described, as compared with a wet plate, never having tried the two under sufficiently similar conditions to be able to decide. I have recently, however, been experimenting to determine this point, and now take much pleasure in giving you the result.

"After numerous trials, I find that in no case, where the same collodion and silver bath are used, does the coffee plate require an exposure of quite double that necessary for a wet plate. I enclose, herewith, specimens, that you may see and judge for yourself as to whether, in each instance, the exposure has been adequate. The dry plates used in these experiments had been prepared a few weeks. I of course employed same lens, stop, &c.; and, in fact, all the circumstances attending the taking of the two portraits were identical, a slight change only being made in the position of the sitter, in order to show that the two were not from the same negative. I gave to the wet plate twelve, and to the dry twenty, seconds' exposure, and in every instance found that this relative difference gave the best results.—I am, yours truly, "J. H. W."

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RESTORING DISORDERED NITRATE BATH.

A method of restoring a disordered nitrate bath, which was proposed some time ago in the United States, is receiving considerable favour amongst American photographers. We published it at the time with some misgivings, as we do not like acetic acid in the bath. All the accounts of those who have tried it are, however, favourable. We quote some interesting comments on the subject by a correspondent of *Anthony's Bulletin.* He says:—

"About three months ago I found something very valuable in the *Bulletin*, which I hope will benefit my fellow workers in the art, and it certainly will if adopted. I consider it worth the price of five years' subscription. It is simply working the negative bath perfectly alkaline and the collodion acid. A clean piece of cyanide is dissolved in a small quantity of water; I generally use a saturated solution. Add a few drops to the bath until you throw down a small quantity of cyanide of silver, which will very soon settle to the bottom; then sun until clear; filter, and it is ready for use. Now add to six ounces of collodion eight drops of acetic acid, which will throw down a small quantity of the cotton, but it can be redissolved by shaking vigorously for a minute or two. The addition of the acid makes any collodion work quicker and cleaner, and forms acetate of silver in the film and makes it more sensitive. Collodion prepared in this way and used with the cyanide bath works a third quicker. I have been working this way since I first saw it in the *Bulletin*, in the Report of the Photographic Section of the American Institute. I really think it one of the greatest improvements made in our art for a long time; it makes clear, brilliant negatives, full of detail and roundness, free from streaks and works in nearly half the time that the acid silver ever did. Collodion prepared with acetic acid will work with any bath, and with less exposure and superior results. The acid should not be added to the stock solution, but by pouring in the vial the night before using. It will keep two months to my knowledge. I know it works very quickly when a dark red colour.

"I had no faith in the collodion or bath; but, after giving it a good, fair trial, am delighted with it. I hope others will try it, and give their experience in the *Bulletin.* All photographers know that a neutral or alkaline bath works quicker, but the old enemy, fogging, has stood obstinately in the way. Do not be afraid of fog; you will have none at all. I had a large negative fog a little, and I had made no change but to mix some developer with some acetic acid just purchased. I changed the acid and had no more trouble. You can sun an alkaline bath quickly, and it does not need boiling until a large amount of ether and alcohol gets in it by constant use; it can be worked down as weak as ten grains to the ounce. I do not believe in adding water to a bath unless you have ample time to sun it thoroughly. You can boil without decreasing its bulk by covering the evaporating dish with strips of glass about one inch in width. This allows the ether and alcohol to escape, and does not change the bath. After boiling and filtering it is ready for use. In adding silver, I add a few drops of the cyanide solution. I believe in working a bath clear; filter after testing, and add cyanide when you filter, for the bath will get a small quantity of acid from the collodion. Old fogies will 'turn up their noses' and say that the good old acid bath has given good results, and they want nothing better. I am glad that I am using something that is far superior, and shall stick to it until some of our experimenters get something better. You can catch a baby with the new method before it can get a chance to think of moving. I use a fifteen-grain developer, with plenty of acetic acid. For babies I use twenty-five grains with a small quantity of acid, as the acid retards the development too much with short exposures. It is just the thing for the unfortunate operators who are obliged to make ferrotypes, as the bath is affected less by the edges of the iron plates.

"I have a new dodge on keeping plate-holders in good order everlastingly. It is chemical proof, and is composed of paraffin, beeswax, and resin, equal parts, melted together. When ordering plate-holders or kits, have them made of black walnut, and not varnished or stained, and apply the wax and heat and rub the pores of the wood full, and silver will have nothing to do with your holders. Dishes for silvering paper and toning can be prepared in the same manner; coat your rubber baths and dippers with it.

Every one who uses a glass bath will find that cleaner work will be the result if good wood dippers are used. I have silvered paper in one of the dishes with the above wax for a year. It never leaked a drop, and can be kept clean easily.

"In conclusion, I would say that in my eighteen years' experience no bath or collodion ever gave as good results as the cyanide bath and acid collodion. If other operators try it, I would like to hear their experience in this direction."

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A WONDERFUL PHOTOGRAPH.

Tidings of a very wonderful photograph come across the Atlantic. Amongst the rarities to be exhibited at the great Centennial Exhibition is an enormous negative produced in Sydney, New South Wales, by Mr. B. O. Holterman. The collection of photographs produced by this gentleman generally are, we understand, very fine; but, according to the *San Francisco Daily*, this especial negative is something unusually marvellous. It would cost, it is stated, 10,000 dols. to produce such a negative in the States, and every print would cost 1,000 dols.! That is, in round numbers, £2,000 for the negative, and £200 for each print! There is probably some misconception of facts, or error of figures here, but we extract the paragraph as it is quoted in our Philadelphia contemporary:—

"Wonders in Photography.—Mr. B. O. Holterman, an amateur photographer from Sydney, N.S.W., arrived lately by the steamship *Australia.* The gentleman has brought with him, for exposition at the Centennial, a collection of photographs and negatives, which, in the opinion of Mr. Rulofson, the President of the Photographic Society, surpasses anything that has ever been done in the world. Mr. Holterman has with him a negative on ordinary glass, 5 feet by 3½, the largest ever taken in the Colonies or elsewhere. The surface is good all over, and its peculiarity is not only its size, according to the dictum of our photographs, but the general chemical effect and the superb details of the negative make it a perfect triumph of photographic art. Mr. Rulofson informed a *Call* reporter that it would cost 10,000 dols. to produce the same negative here, and that every print would be worth at least 1,000 dols. The largest negatives made in this town are 20 by 24 inches, and they require unusual artistic skill. Mr. Holterman also exhibited to the reporter a print of a view from his own house in Sydney, which is 22 feet long, and some of the buildings photographed therein are at least three miles distant from the camera. Messrs. Bradley and Rulofson have offered the use of their studio to Mr. Holterman for the purpose of exhibiting his prints and negatives, which will attract the attention of the public, as well as that of the practical workmen in the art of photography."

A brief paragraph on another page of our Philadelphia contemporary possibly furnishes a key to the error. It is there stated that Mr. Holterman is "the inventor of the apparatus which has successfully demonstrated a problem in the art that has long bothered the heads of experimenters. The subject is a view of Sydney, Australia. It has cost Mr. Holterman over 12,000 dols. to perfect his invention, and when seen in the East and in Europe, it will no doubt create a stir in their photographic circles as it has in ours." From this it seems probable that for cost of "negative" and "print" we may read cost of original invention and subsequent examples of the apparatus.

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A TRIP TO THE HEBRIDES.

BY REUBEN MITCHELL.

Having furnished myself with a new outfit for sketching and photographing on a much larger scale than before, namely, for pictures eighteen inches by sixteen inches, together with the instruments of my young friend and compagnon de voyage, our pile of luggage made quite a formidable appearance at the Trinity Street Station. Having taken our tickets for Glasgow, our luggage deposited in the van, we took our seats, and were soon speeding our way, full of anticipation of a successful journey, which I am glad to say proved quite satisfactory. We arrived in Glasgow safely, and rested for the night at the Windsor Hotel. The following morning we provided ourselves with return tickets from Glasgow to Inverness, and having seen to our luggage being put in the van, took our seats in the train, and were soon steaming on our way on the Highland Railway through green fields and cosy farmsteads, the old tumbledown cottages having given way to neat modern farm buildings, the general form being a square with the yard in the centre. These improved farmsteads are suggestive of the improved state of things since the introduction of the railway. But the farmers are not the only parties benefited: in many places new villages and old ones are fast growing into towns. At the various stations on the line, many of them were so pleasantly situated that we could have spent a few days enjoying the charming scenery around. The Pass of Killicrankie is a most interesting place, nestled in a lovely glen. The whole distance from Glasgow to Inverness is varied from the most peaceful to the wildest. One portion of the road is only a single line, winding its way through woods of stately Scotch firs and scrub, the branches almost touching the carriages as we passed along.

All appears so different to travelling on railways in Lancashire, that the change is most agreeable. Arriving at Inverness, we fortunately decided to continue our journey to Dingwall, twenty miles beyond Inverness. We learnt afterwards that it was the annual wool fair, which lasts for several days: all the hotels were full, and no accommodation to be had. We rolled into Dingwall station about dusk, about two hundred miles from Glasgow, heartily glad to rest for the night. Dingwall is a small coast town, situated in a rich farming locality; golden cornfields meet the eye in all directions. After breakfast the following morning, having some spare time, we took a stroll through the town, but finding nothing interesting, we returned to the station, having left our luggage there all night. We took a single ticket to Strome Ferry, to enable us to vary our route as circumstances might suggest.

The distance from Dingwall to Strome is about sixty miles, through most charming, but very varied scenery. The first station from Dingwall is Strathpeffer, from which there is a fine panoramic view of the valley below; rich cornfields, stately trees, and comfortable homesteads, altogether make a most delightful picture. The line from Strathpeffer to Strome rises to a considerable elevation above the sea, and then descends again into the valley, most interesting—at times passing through wild rocky passes and over-hanging crags, then opening into fertile valleys, with lakes and tumbling streams; the banks overgrown with scrub and fine trees. In one of these valleys Achnasheen station and hotel are situated, a most charming spot for a few days' stay. Excursions by coach can be made from here to Loch Maree, and other places of interest. Leaving here, the line descends into Glen Carron and Loch. A more charming glen can hardly be conceived. A Mr. Matheson has a hunting and shooting box here, situated on the margin of the Loch, amongst mountains, stately trees, and a most picturesque mountain stream running within a few yards of the house, the whole making one of the loveliest of pictures. Leaving Glen Carron station, and descending into the valley below through the wild rocky passes, with overhanging crags which seem to threaten the passing train with instant destruction, the train again emerges into a fine open valley running along the shore of the sea loch to the station at Strome Ferry, where there is a good pier for loading and unloading the steamers, also a small hotel, and a few cottages for the Company's servants.

We had several hours to wait here, so we had dinner and tea at the hotel, and strolled about and made some sketches. Towards evening the sea became a dead calm; the surrounding mountains and other objects were reflected in the water. The Railway Co.'s steamboat the *Ferret* left Strome for Portree, Skye, about eight o'clock p.m., amidst one of the most glorious sunsets I ever beheld: the sea appeared like liquid gold, and continued so till after we had landed at Portree, in Skye, which took the steamer about four and a-half hours to cross. The distant mountains in Skye were of a hazy grey purple, the rugged rocky coast contrasted so strangely, appearing of a dark velvety brown colour, and reflected in the water. The eastern horizon appeared a cold ashy dark grey; not a ripple on the water except what was caused by the steamer cutting her way through the water. I remained on deck the whole of the time in crossing. Such a grand sight must be seen to be appreciated.

The passengers appeared to be farmers returning from Inverness Wool Fair. I made several attempts to enter into conversation with different passengers, but as they spoke Gaelic, I could not get on at all, not knowing it myself. There was a fine gentlemanly-looking man in full Highland costume, pacing the deck. I accosted him, and soon got all the information I required, as he spoke English very fluently. In conversation he told me he was from Northumberland, and had settled in Skye as a sheep farmer; he was most kind in giving me any information I required. We arrived in Portree Bay shortly after midnight, and engaged porters to remove our luggage from the steamer to an hotel on the quay, where we remained during our stay at Portree, a small interesting town.

(To be continued.)

TECHNICAL NOTES.

BY M. DAVANNE.

Developer with Sugar and Lime—Portraits without Negative Retouching—Tannin Process—Intensifying Photo-lithographic Cliches—Intensifying with Prussiate of Potash and Lead.

Developer with Sugar and Lime.—I have tried whether in alkaline development the ammonia, carbonate of ammonia, or other alkalies employed, can be set on one side in favour of saccharate of lime, and, without wishing to say that better results may be thus obtained, I can assert that the saccharate works quite as well, if not somewhat quicker, than alkalies in the developer. My formula is given below, as it may be useful, seeing that sugar and lime are to be found everywhere:—

Ordinary water	... 100 grammes
White sugar	... 10 ,,
Slaked lime	... excess
Bromide of potassium	... 1 gramme.

The more sugar there is contained in the solution, the more lime can be dissolved. So much lime must be taken that an excess of it remains undissolved. Burnt chalk is sprinkled with a little water until it begins to break up, and then the rest of the water is added. In case the dry plates to be developed contain gallic or pyrogallic acid, you proceed in the following manner:—The plate is covered with water, which is then poured off into a glass measure and mixed with five per cent. of the saccharate of lime solution. This mixture is poured upon the film, and the picture is gradually developed. To intensify the picture, two or three grammes of pyrogallic acid solution are added of ten per cent. strength. The image becomes very rapidly intense under this treatment. The liquid also becomes blackish, but the image washes perfectly clean.

Portraits without Negative Retouching.—A process has been patented by M. Hammel, in Prussia, Bavaria, Wurttemburg, Saxony, Baden, Hessen, Austria, England, Russia, Italy, Spain, and France, which is termed "photo-plastographie," which consists simply in coating both sides of the glass plate with collodion, and sensitizing and developing the same. All the manipulations have of course to be undertaken in baths.

Tannin Process.—Mr. J. Dubost has found out that the application of a two per cent. solution of tannin to a dry and sensitive film yields a more vigorous negative, if washed with water afterwards, than if the tannin is allowed to dry upon the collodion. It also appears that such washed tannin plates require shorter exposure than those upon which the tannin has become dry.

Intensifying Photo-lithographic Cliches.—Captain Waterhouse recommends that negatives of engravings and the like should be treated first of all with nitrate of lead solution (Eder and Toth), and then with iodide of iron solution; they should then be vigorously washed, and further treated with permanganate of potash solution. The film becomes of a deep brown black, and the lines remain perfectly clear. Nitrate of lead and dichromate of potash yield, it is true, an intense yellow film, but it has a tendency to cover the lines, which should under any circumstances be avoided.

Intensifying with Prussiate of Potash and Lead.—Messrs. Eder and Toth have communicated to the Vienna Photographic Society a memoir concerning their new lead intensifier. According to this, a negative to be employed for photo-lithography should be very intense in the ground work, and clear in the drawing; this is seldom attained in the ordinary method of intensifying by means of silver, as by this treatment the picture often gets fogged or blurred. By employing lead as the intensifier, sufficient vigour may be obtained with negatives that have received but short exposure, and have been developed with iron. After fixing, the film is thoroughly washed, finally with distilled water, and is laid in a filtered solution of:—

Distilled water... ...	... 100 grammes
Red prussiate of potash	... 6 ,,
Nitrate of lead... ...	... 4 ,,

(Only distilled water may be used, for if spring water be employed, this brings about a general precipitate all over the negative.)

The negative should be dipped into this bath as soon as it is fixed, and then but a few minutes are necessary for intensifying. If, however, the negative has become dry, then it should be put to soak in water for some hours before it is put into the lead bath. Even in that case, the process of intensifying takes a much longer time. For this reason it is better not to let the negative dry before it is intensified.

During the action of the lead bath, there is deposited upon the silver parts of the picture a faint yellowish white precipitate, which makes the film appear quite white, and possesses an extraordinary amount of intensity. It is necessary to allow the negative to remain in the lead bath until it has assumed the same amount of density which you require in the end, for the next treatment with sulphide of ammonium is for the purpose rather of rendering the film permanent than to augment its density.

The action that goes on is similar to what takes place in the uranium intensifying process. The silver works as a reducing agent, and the red prussiate of potash passes into the yellow form, which then forms an insoluble compound—ferrocyanide of lead—with the lead salts that are present. It is now necessary to convert the unstable lead compound into a permanent and perhaps more opaque compound, and this is done by the action of the sulphate of ammonium.

After the negative has been taken out of the lead bath and well washed with distilled water, the sulphide of ammonium is applied. In washing, the colour of the film should almost become white; and if it is desired to know whether the washing process has been carried far enough, a few drops of the rinsings are allowed to fall into a little iron developer. If no blue colouring is to be observed, then the washing has been completely successful. The sulphide of ammonium is employed in the form of an aqueous solution of twenty per cent. strength, and immediately upon its application the image becomes perfectly black. The operator waits until the image is blackened right through, and then the sulphide of ammonium is washed off with ordinary water. In this way the most transparent lines may be secured upon a perfectly black ground.

The method of intensifying with iodine, and treating afterwards with sulphide of ammonium, is now very generally used by photo-lithographers. A very good test experiment may be made by intensifying the one half of a negative with iodine and sulphide of ammonium, and the other half with lead and sulph. of ammonium; in the end it will be found that the intensity of the two halves is in the proportion one to three.

The lead solution will keep good for weeks, nay, even for months. As time goes on it works more slowly, from the circumstance that a portion of the prussiate of potash salts is gradually decomposed, and in this case more nitrate of lead and red prussiate of potash (about one-quarter or one-half of the original quantity) are added. It is advisable to filter the bath frequently.

If the negative has not become sufficiently dense in the bath, even after a long sojourn, which frequently happens with very thin negatives, there is another plan of making the film still denser. This is to use sulphate of cadmium, of which ten grammes are dissolved in eighty to one hundred cubic centimetres of water. The negative is removed from the lead bath, thoroughly washed, and then placed in the cadmium solution, when the image should become perfectly white. It is then washed with distilled water, and afterwards with spring water, and subsequently treated with sulphide of ammonium; finally, it is well washed with spring water.

The action of the sulphate of cadmium may be explained in the following manner:—The sulphuric acid of the salt combines with the lead in the picture, the ferrocyanide, which was previously mixed with the lead, combining with the cadmium, and also forming insoluble ferrocyanide of cadmium. The lead, as well as the cadmium and silver in the picture, is converted by the sulphate of ammonium into metallic sulphate.

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HOW TO MAKE AND USE A SMALL PHOTOGRAPHIC BATH.

BY W. SNELL.*

Photographers who have large galleries and do large work must of necessity use large baths. Those who have galleries in small towns, or travelling saloons, have seldom occasion to use larger than to take 4-4 or 8 by 10 plate. There are some things to be said in favour of a small bath in preference to a large one. It is, first, much less expensive; then it is much easier to handle and less liable to waste Where one does his own operating, and has sufficient experience and knowledge of his chemicals to keep them in working order, he should be able to work as successfully with a bath of half-a-gallon as with one four or six times as large. The bath should be made upright at first, then " left severely alone."

Pure silver and distilled water will make a bath which will not require sunning or boiling; but as this water is frequently not at hand, good, soft spring water, or from a piece of ice, or river water, will do. Put one or two ounces of silver into a quantity of water sufficient to fill your bath-holder, with a little excess; place it in the sun for six or eight hours, or, what is just as well, place it over the fire in the evaporating dish, and bring it to a boiling heat. Either method will throw down all impurities in the water. Filter, and add silver to make it up to forty grains to the ounce of water by the testing tube (which every one should have)—not more than forty grains strong, as much trouble often meets you at once when made stronger.

Coat a large glass plate on both sides with collodion, and let it remain in the bath over night. Filter the bath again, and try a plate; if it works clear and clean, add no acid; if a little foggy, add two drops of C. P. nitric acid to fifty ounces of solution. Now, after using a few plates, it will work all right, and should not be altered for weeks, unless it be to add more of the same solution of which the bath was made.

If you work with care, with clean plates, and clean fingers, the bath will not need filtering oftener than once a week, or once in two weeks, according to use. It is a positive evil to be filtering the bath every day. When by use the bath works oily by excess of alcohol and ether, but well otherwise, add a little alcohol to the developer, and use the bath as long as possible. When it fails to make good negatives, pour it into the evaporating dish, add eight ounces of water, and place it over the fire; when it gets to boiling heat add a few drops of a solution of bicarbonate of soda. This will neutralise the acid and precipitate the excess of iodide of silver.

Boil down the bath to the same quantity of solution as before, adding the water. When cool, filter and test it. Make it forty grains strong, and, if alkaline by litmus paper, add two drops of acid, or more, so as to leave it slightly acid.

It now should work as well as when new, and can be used with a good collodion until it is reduced to nearly thirty grains. After it has been renewed and boiled down the second time and gives out, it should be discarded for negatives, and can be often used for ferrotypes and for redeveloping purposes. By this method the bath can be utilised to such a degree that there need be but little waste.

Remarks.

Glass is the most reliable for a bath-holder. If it cost a little more at first, it is cheapest in the end.

By having two baths much trouble is avoided.

By using a few drops of water in the collodion you will never be troubled with pinholes.

An excess of water or bad cotton will make the collodion work in crapy lines.

Much trouble often arises from a bad sample of cotton.

When things work badly the bath should not be condemned at once. Work more carefully. See that the plate is clean. Let the collodion set on the plate well before dipping.

In cold weather the plate will develop woolly, with metallic silver over it. By warming the bath the trouble vanishes. The bath should be kept warm in cold weather. By doctoring the bath frequently with this, that, and the other nostrum, which is often recommended, you will have plenty of trouble and annoyance.

Ferrotype plates should not be dipped in the negative bath.

Baths for ferrotypes should be made and treated the same as for negative use, but can be used with less silver.

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Correspondence.

PHOTOGRAPHY IN CONTINENTAL CITIES.

Sir,—I can heartily sympathize with your correspondent, "An Amateur Photographer," and his difficulties in trying to photograph Paris, as I had the same trouble myself when in Rome last winter: not that there was any difficulty in photographing in the streets, although I was told afterwards that a permit ought to have been obtained; I allude to those cases where the ruins were only entered by permission or payment, such as the Colliseum, Gardens of the Palatine, Baths of Caracalla, &c. I spent a great deal of time during seven weeks in finding out where to obtain this permission, was sent very near to heaven up in the roof of the Vatican, and to sundry other places, and spent a large sum in cab hire, without arriving at any result until two days before leaving, when I at last managed to get the necessary permission. This, however, ultimately proved of no value, as the two days in question were utterly unsuited for photographic operations. In consequence, I missed some of the most interesting monuments of Rome. In Naples I found no difficulty, as I easily obtained a permit to photograph the ruins of Pompeii and the objects in the Museum. Had I been in your correspondent's place, seeing the difficulty anyway of photographing a crowded street, I should have asked permission to enter some café or other building from which he might, without being observed, have got plenty of suitable views. I am not cognisant with the new law, but should hardly imagine it could prevent persons from taking photographs from their own dwellings.

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* *Philadelphia Photographer.*

W. B. Woodbury.

MAKING YOUR OWN COLLODION.—INSOLUBLE GELATINE AS A SUBSTRATUM.—CYANIDE.

Sir,—For a long time I never could be induced to try or use any other collodion than Mawson's and Huggon's; but I recently made up my mind to try the collodion recommended by Mr. George Croughton in your last issued Year-Book (that is, a potassium collodion), and a cadmium collodion, the latter by Hardwick's formula. I feel bound to say that the result is quite in accordance with Mr. Croughton's statement. It is the most sensitive collodion I have ever used. My first experiment did not turn out just to my satisfaction, because I did not pay attention to the specific gravity of the ether and alcohol, using, as I did, ordinary spirit of wine instead of absolute alcohol and methylated spirit. I used at first common gun-cotton, as generally sold by dealers; but its solubility is not equal to Anthony's cotton. If any one of your readers is inclined to try his hand at making his own collodion according to the formulæ given in the Year-Book by Mr. G. Croughton, let him use Anthony's cotton, ether (sp. gr. 725, and absolute), and methylated spirit. When the collodions are first made, they turn very red indeed after the iodizer is added; but when they are mixed, in the course of four days the collodion turns to a very pale lemon colour. Do not begin to use it until ten or twelve days old. For taking children this collodion surpasses anything I have tried. The cost of making is four shillings and sixpence per pound. The plates I have used it upon are quarter-size to twelve by ten, which I think is a sufficient test of its good flowing qualities; at the same time it is quite free from crapiness.

I notice in this week's News M. Ernest Lacan speaks of M. Liebert as using gelatine made insoluble by chrome alum to get an adhesive ground for carbon transparencies. I hope M. Liebert does not mean to include this in a patent, because the priority of the use of this certainly belongs to Mr. J. Willis, which process is clearly given in your last Year-Book. I have used the method as there described most successfully—in fact, I was never able to get a good carbon transparency until I saw this means given by Mr. Willis.

With regard to restricting the sale of cyanide of potassium, although not absolutely necessary to the photographer, how can electro-silver plating be carried on without it? It is this salt that forms the liquid mixture for nearly all the processes known in electro-depositions. Working as I do at electro-silver plating as well as photography, I know full well that if a heavy restriction were put upon the sale of potassium cyanide, I should be compelled to get the ferrocyanide (which is not poisonous) and carbonate of potash, and make my own cyanide. You may depend upon it, Mr. Editor, that when a man makes up his mind to commit suicide he will do it under any restriction, whether he can get cyanide of potassium or not. I have noticed, especially with one sample of commercial collodion, that when the negatives are fixed with sodium hyposulphite, they are very hard indeed; while another sample by a different maker gives altogether a different result. Tons of cyanide of potassium are used in the course of a year for silver plating, and I think it would be a very hard thing indeed if the use of so useful a chemical should be restricted because of a few foolish people who choose its adoption in destroying their lives.—Yours truly, A. J. Jarman.

41, *Queen Street, Ramsgate, August* 26.

[It is not in especial relation to suicide that we urge photographers to avoid the use of cyanide, but because it is a very fatal poison, and its common use increases the chances of accidental poisoning. It is, moreover, dangerous as an absorbent poison. It is more important in electro-plating, undoubtedly, than in photography; but the possibilities of superseding it by other agents scarcely come legitimately for discussion in these pages.—Ed.]

CYANIDE.

My Dear Sir,—I have read with great interest your article on "Cyanide of Potassium." I quite agree with all the remarks that were made in the News, and how hard it would be to stop its use. Yet, notwithstanding all this, how much better photographers would be without it! I, for one photographer, have used it, and given it upon account of its awful propensities. I happen to know a brother photographer who is suffering from cyanide of potassium. Having a few chaps on his hand, the cyanide got into them, and there he is laid up, and hardly fit for anything. Now, I will put it in rather a broad way: Which is the best—wealth with health, or wealth without health? The first, I think, can be obtained by hypo, the second by cyanide of potassium. It is true cyanide is the cleaner and most rapid, but I have left off cyanide only just lately, and used hypo. I have this last week been photographing at a lady's house, and have only used hypo. My prints are equally as good as those when I used cyanide of potassium. I dare say a great many photographers will say, "Oh, indeed! What can one man know? Rubbish!" &c., but they will find out that I am right in the long run.—Yours very truly, C. R. P. Vernon.

Grafton Underwood, Kettering, August 28.

PAINTINGS AT SOUTH KENSINGTON.

Dear Sir,—Will you allow me, through the medium of your valuable journal, to call the attention of the "brethren of the camera and brush" to a splendid collection of oil paintings by old and foreign masters, principally portraits, now on view in the galleries at the South Kensington Museum, and which have been kindly lent by the Earl of Spencer. To those gentlemen who execute work in the so-called Rembrandt style, a good opportunity now presents itself of studying the original works of that celebrated master. There are also some splendid examples by Reynolds, Lawrence, Gainsborough, Angelica, Kaufmann, &c., and a visit to the galleries will, I am sure, amply repay anyone who is at all interested in the production of human portraiture.—I am, dear sir, yours faithfully,

South Kensington, August. Geo. Cecil Hance.

PS.—I would advise the visitor also to inspect the National Competition drawings and paintings, where he will see a wonderfully fine painting of a piece of cheese, &c., executed by a provincial young lady.

Talk in the Studio.

Another Suicide by Cyanide.—An inquest was held a few days ago at Paddington on the body of a man unknown, who was found to have committed suicide in a coffee house, where he was spending the night. A large bottle of cyanide was found on the table, some of which he had taken and poisoned himself.

Photographing Prisoners.—Capt. Redin, the Governor of Carlisle County Goal, writes as follows:—"I have been from home for a month, and did not see your article on 'Photographing Criminals,' in your News of the 4th inst., until this morning. You have been misinformed, as far as County and Borough prisons are concerned. We have received no instructions from head-quarters to curtail our printing of criminals, and go on as usual."

Warning to Photographers.—Our attention has been called to the necessity of warning photographers against a person who is in the habit of calling at metropolitan studios under pretence of purchasing silver residues, &c., failing, however, to remit the promised amounts. There is reason to believe that he has been engaged in these nefarious practices before, and that similar warnings appeared in the photographic journals some time ago in relation to him. He is described as about forty years of age, manifestly not an Englishman, and of untrustworthy aspect. He is said to pass under two or three *aliases*. Photographers will do well to be cautious in their dealings with any such visitor whose credentials are of a doubtful character.

Toning Transparencies.—A correspondent, referring to a recent "Answer to Correspondents" in our columns, states that in using gold for toning, he finds it an advantage to use the sulphocyanide bath, as it yields a richer, warmer tone. He has worked a good deal by rule of thumb, and cannot give precise quantities. He has also used chloride of copper, followed by alkaline pyro, with advantage, which gives a rich warm tone. He asks if this will be as permanent as gold toning. Time only can satisfactorily test its permanency; but a deposit of copper is certainly not likely to be as permanent as a deposit of gold.

Unauthorized Sale of Portraits.—A contemporary asks, "Why do not Mrs. C. Bravo's friends stop the sale of her portraits in the shops and streets? Surely she has a vested interest in her own photographic likeness, and can prevent its exposure to the public."

Nitro-Cumic Acid is mentioned in the *Scientific American* as a new photographic agent. Exposed to light, it rapidly alters to a deep red colour. A solution of the substance exposed to light deposited red amorphous flocks of an acid nature, soluble to a beautiful rich red liquid in alkaline solutions. By the action of reducing agents it yields a yellowish brown powder, which readily decomposes, while oxidizing agents convert the red acid into a yellow powder.

Schweitzer's Solvent for Cellulose.—Prof. C. Neubaur recommends the following method for obtaining the well-known cupro-ammonium solution for technical use:—He prepares an oxide of copper by the precipitation of sulphate of copper solution with caustic soda, in presence of sal-ammoniac. The resulting precipitate is thoroughly washed with water, first by decantation and then upon a filter, after which it is preserved under water. To prepare the cupro-ammonium solution, the oxide above referred to, after thorough agitation with the water, is slowly added to a quantity of ammonia contained in another vessel. The addition of oxide is to be continued so long as the same is dissolved by the ammonia. The resulting deep-blue coloured solution dissolves cotton wool at once, and in considerable quantity.

To Correspondents.

B. S.—Of the lenses you name we should prefer No. 2. The lens you have already, with diameter of two one-sixteenth inches, and a focus of four and three-quarter inches, ought to be very quick instead of slow if you are working with its full available aperture, which you appear to do. Probably you will find inside a fixed stop instead of somewhat contracted aperture. If so, removing this stop would greatly increase the rapidity of action, but would injure marginal definition. Its removal might, however, for some purposes—vignettes, for instance—give you some advantage.

B. F. N.—A neutral solution of chloride of gold, if kept in the light, is apt to become purple from precipitation of metallic gold in very small particles. We always recommend that a toning solution should be kept and worked in a dark room.

Nemo.—Water containing iron would undoubtedly be undesirable for washing prints; but whether water circulating in iron pipes for warming purposes would contain an appreciable quantity of iron we cannot say.

A. L. O. E.—We have published many formulæ for matt varnish. That to which you probably refer as drying so rapidly has been described by Mr. A. Hughes in our pages and in one of our Year-Books. It consists of about a drachm of a suitable gum resin; sandarac will answer, or, better still, a mixture of sandarac and mastic dissolved in an ounce of sulphuric ether and about half an ounce of pure benzole. Some judgment is required in preparing the varnish, as different samples of solvents sometimes require variation in proportions. This varnish also gives occasional risk of dissolving the film, owing to the ether in its composition. It gives a good surface when applied to opal pictures for finishing in water colours.

R. L.—So far as our experience goes we prefer No. 1. A cabinet size will answer well for most businesses, as it is rarely desirable to burnish the surface of larger pictures.

L. G.—The reddish fog which is sometimes deposited on the shadows whilst intensifying with pyrogallic acid and silver may generally be prevented by giving the film a wash of dilute tincture of iodine before commencing to intensify. When the deposit is there, its effect may be considerably neutralized by giving the film a wash with a weak solution—say five grains to the ounce—of bichloride of mercury; this will change the copper-coloured deposit white, and so cause so little obstruction of light that the fog will scarcely show in printing. It can also be removed by the application of iodine and cyanide, and also by nitric acid; but in using these methods there is much danger to the negative.

R. S.—You can, of course, if you choose, lend the negative to produce an enlargement; but it should be distinctly understood that you do so as a matter of courtesy, not as a matter of right. The negative, we hold, is the property of the photographer, not, of course, to use for any purpose but supplying the sitter with portraits; but, as an aid to the production of such portraits, it is as much the property of the photographer as is the camera in which it was taken.

E. G. L.—There can be little doubt that the best results in enlarging are produced by means of a transparency and enlarged negative. Developed prints on paper are rarely so good in colour or so brilliant as those printed from a negative direct. The relative cost of the methods we have never attempted to calculate. The great difficulty with the solar camera arises from the necessity of direct sunlight, so uncertain in this country.

F. K.—Alcohol is frequently added to the silver bath for the purpose of preventing its ready discoloration. It aids in this in two ways: it helps to coagulate the albumen, and it reduces the solvent tendency of the water. The proportion is about three ounces to every pint, or, rather, seventeen ounces of water and three ounces of alcohol to make up the pint. Methylated spirit will do. When the bath is discoloured, add a little common salt, or a little carbonate of soda, and shake up with the solution. This causes a precipitate, which takes down with it the colouring matter.

G. A. D.—Reticulation is almost invariably the result of the use of solvents containing too much water—that is, the spirit and ether were insufficiently rectified. Sometimes a faulty sample of pyroxyline will give a collodion which reticulates, and sometimes too hastily immersing a plate in the nitrate bath will produce the effect; but, as a rule, the solvents are at fault. There is no remedy with such collodion, but mixing it off with a horny repellent sample which will do with a little more water.

A. H. M.—The News is published at ten o'clock on Friday morning. Copies for the country are posted in London before eight on Friday morning. 2. We do not quite understand your question, "Can as good effects be got on opal enlargements from card negatives to 12 by 10 by the lime light as in the camera?" How do you mean to produce the enlargements by the lime light out of the camera? and by what process do you mean the others to be produced in the camera? 3. As a rule, each writer should be his own interpreter, and we cannot necessarily say what a writer in a quoted article means if he be not quite clear; but in the case to which you refer the matter is clear enough. The use of a second weak bath has been often recommended as securing greater certainty of cleanliness, and checking any tendency to over intensity. 4. For opal pictures pyro is better.

E. G. W.—The effect in your cards is similar to the mezzotint vignettes, but not the same. The question of what constitutes infringement is one rather for a lawyer than an Editor, but we should think these are not.

Henry Jones.—Precise information as to the general question of licenses can be obtained from the Autotype Company, and such information will be authoritative, whilst we can only give an opinion. 2. There is no mode of applying a spirit varnish to negatives nearly so good as the ordinary method of doing it in front of a fire. The use of a flame is always dangerous when a spirit varnish is used. We have seen various contrivances to shield the flame within a tin box, and lean the negative against it; but nothing so good as the fire.

Received.—Large vignette papers from D. Waymouth; and Der Kohl Druck, by Dr. Paul E. Liesegang.

Several Correspondents in our next.

The Photographic News, September 8, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Photographic Certificates as to Character—The British Association, Past and Present.

Photographic Certificates as to Character.—If we were asked to pick out the vainest and most conceited man in any body of individuals, we know of no readier method of doing so than to photograph them in a group. We could be pretty sure of our judgment then. Take any group picture you like, whether of students, philosophers, or what not, and you will have no difficulty in putting your finger at once upon the most self-satisfied being in the assembly. The test might fail, perhaps, where you had to do only with vestrymen, city magistrates, and the like, but then, in all probability, it would answer in a negative sense, say to indicate any modest, unassuming individual, supposing, by chance, such a person made one of the group. And this leads us to the question of posing onesself when being photographed. If the sitter would only sit down before the camera as he would under ordinary circumstances, all would be well; but the man who would do this would not object to a photographer's strictures; it is rather he who has strong notions of his own about attitude who resents the interference of the photographer, and is not, therefore, content to sit down as an ordinary individual, but must perforce put on some free-and-easy manner in which to be pourtrayed. In the same way as what seems to be a stiff pose to the sitter may not appear constrained at all in the photograph, so a free-and-easy attitude, let it be as unstudied as you like, very frequently has only slovenliness and untidiness to recommend it when you look at it in the picture. A very apt illustration of this is furnished by the theatrical world just now. There has been a large importation of ready-made gentlemen of late into the profession, and very capable actors some of them have proved themselves to be. But none of them have made a mark in the walk they aspired to, that of *jeune premier.* However graceful and elegant their deportment may have been in private life, their action is quite the contrary in a drawing-room upon the stage; they appear stilted and constrained, nay, even vulgar, sometimes, in their walk and attitudes, and they have yet to learn from such practised actors as Charles Mathews or Sothern how to appear as gentlemen on the boards. So it is with photography. A young fellow will often protest, "I want to be taken now just as I am," and he sits, perchance, across a balustrade, with a short pipe in his mouth. He thinks the pose is easy, unsophisticated, "with no demned nonsense about it;" but he is generally disappointed to find that his shoes look very untidy in the picture, and that there are most ungraceful folds in his hitched-up trousers. And even if he does not mind these little matters, it becomes rather provoking to find the score of portraits which he distributed among his friends appearing year after year in the albums after he has grown older and wiser, with the same knowing smirk on his face while sucking at that everlasting short pipe. He wishes to goodness such an atrocity had never been perpetrated, and repents that he did not allow the photographer to have his own way, and pose him first of all in some natural and becoming position. However, in the end the photographer has nothing to complain of, for henceforth he finds his whilom customer the most plastic of models. It would be a good plan, perhaps, to let models, or at any rate the strong-minded ones, have their own way invariably first of all, and then there might be a chance of doing something with them afterwards.

The British Association, Past and Present.—The report of the British Association which has just been issued, and contains the proceedings of last year's assembly, contains much that is interesting to photographers. In the first place, among its illustrations, are two examples of Collotype printing by the Autotype Company, appended to Sir John Lubbock's report on the exploration of the Victoria Cave at Settle, in Yorkshire. They are small views, seven by four and a-half, the first being a general view of the cave and cliffs above, and the second is a nearer view of the boulders near the entrance, with certain arched niches and pinnacles shown in detail, the stones being marked or lettered, before photographing, in accordance with their geological constitution—silurian, conglomerate, stalactite, &c.—so that not only the form, but the nature, of each boulder can be ascertained at a glance. Several of the papers in the report are of interest from a photographic point of view: there is M. Janssen's note on his Transit of Venus observations, Prof. Stokes and Mr. J. Hopkinson's paper "On the Optical Properties of a Titano-Silicic Glass," and Captain Abney's "Memoir on the Ratio of the Actinic Power to the Illuminating Power of the Magneto-electric Light." The meeting this year, as our readers know, has just commenced at Glasgow, and there is, we are glad to see, a photographic exhibition to be organized in connection with it. So little has been done lately in the way of bringing forward novelties in connection with photographic art and science before the British Association, that the present year would afford a capital opportunity for doing so. There are so many capable photographers and photographic chemists in Scotland, that it would be a pity, indeed, if some effort were not made to get the art properly represented at the British Association on the present occasion. No doubt the great feature of the meeting this year will be the report of Sir Wyville Thomson's three years' journey in the *Challenger*, and it is rumoured that a special exhibition will be made of the specimens (or we may call them trophies) which his energetic staff of explorers brought home with them. We may be sure that among these interesting relics will be found a large collection of photographic records of the progress of their journey, together with pictures of strange phenomena they may have witnessed. Altogether, we may prophecy that the present meeting will be a popular one, and, from the circumstance that so much charming scenery lies in the vicinity of Glasgow, many will be tempted for that reason alone to take part in the gathering. Excursions to Loch Lomond, the Trossachs, and Loch Katrine may be made in a day, whilst a pleasant trip down the Clyde to the Kyles of Bute would not occupy more time. Again, the Falls of the Clyde, near Lanark, is easily visited from Glasgow by those on their way to Edinburgh, so that visitors to the British Association have quite an *embarras de richesses* in the way of pleasure tours to choose from. Those who are photographers, whether amateur or professional, will find an abundance of charming studies for their cameras, and now-a-days, with dry plates and negative films, there is no need of any cumbersome luggage. We do not think that the British Association, as it grows older, increases in interest, or that it repays one altogether for a long journey by its sections and papers alone; but taken as an annual gathering where men of similar natures meet and converse, and where they may spend a few days upon pleasant excursions, it is no doubt a boon to many who desire to associate with kindred spirits and spend a week in company with friends and acquaintances.

THE OPTICS OF PHOTOGRAPHY.

BY PRESIDENT HENRY MORTON.[*]

Another source of error lies in the fact that the rays of light are of different refrangibility; so that the red rays will pass to one, and the violet to the other, end of a band called the spectrum, in which the other colours occupy intermediate positions. Now, as these different rays possess different photographic power, we would obtain an image of varying intensity. This is called chromatic aberration. To correct this defect, a similar arrangement is employed, as in the case of spherical aberration. It has been found that some kinds of glass possess a greater power of dispersion—that is, of separating the rays of different colours—than others. Taking advantage of this property, the lens B, Fig. 7, is made of heavy lead glass, having a high dispersing power. With the lens A alone, the ray, S, would have been separated into a series of colours stretching from V to R; but on passing through B, they undergo a reversing process, and are brought to a focus at F. Either lens alone would produce a chromatic aberration; but placed together they correct each other, because they act in opposite directions.

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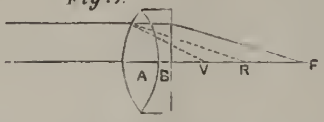
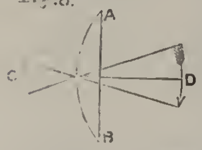
[*] Continued from page 411.

Fig. 7.



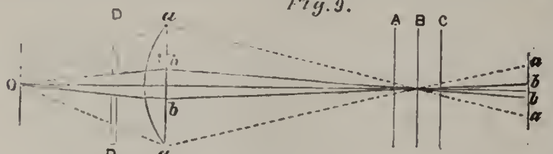
A third source of error is what is known as the curvature of the field. It is evident, on inspecting Fig. 8, that rays of the same length, passing from an object, C, through the optical centre of the lens, A B, will not form a flat, but a curved, image. If, therefore, a flat screen is placed at D, the top and bottom of the arrow will be out of focus; and if the screen is properly placed for the top and bottom of the arrow, the middle will be out of focus. The different parts of the image evidently do not lie in the same plane; and to correct this error, the same device will have to be employed as in photographing at the same time objects lying in several different planes more or less distant from each other. In other words, we must produce what is known as "depth of focus." This is necessary even in taking a portrait, where the nose and the ears of the sitter, for example, would come to a focus at different distances from the lens.

Fig. 8.



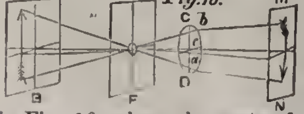
The depth of focus is increased by means of the diaphragm or stop, an ingenious contrivance, shown at D D, in Fig. 9, by which all rays coming from an object at O are cut off, with the exception of those passing through the opening. Without the stop, the outer rays, O *a*, would diverge considerably on both sides of the focal point cut by the screen, B; and if this screen were moved to the position A or C, the curvature of the resulting image would become very appreciable. With the stop, however, the screen could be moved anywhere between A and C, and a tolerably sharp image produced.

Fig. 9.



It is not possible, however, by the use of the diaphragm alone to correct the curvature of the field entirely. The effect of the diaphragm is really to divide the lens into as many little lenses as there are pencils of light passing through it. Some of these pass through the ends of the lens where there is greater converging power, and are consequently brought to a nearer focus than those passing through the middle. This circumstance of itself would tend to produce a distortion. This is shown in Fig. 10, where the parts of the arrow, A B, not lying in the axis of the lens, C D (and consequently obliged by the diaphragm, E F, to pass through the ends of the lens, at *a* and *b*), are brought to a focus nearer the lens than the middle points.

Fig. 10.



It has been found by experience that a convergent meniscus lens, provided with a stop and placed with its concave side toward the object to be photographed, will produce the least amount of curvature of the field. When the convex side is turned towards the object, a greater curve is produced in the opposite direction. Hence, by combining two such meniscuses, and placing a diaphragm between them at the proper relative distance from the lenses, this fault is entirely overcome. These and other considerations, which would take us too far, led Mr. Zentmayer, of Philadelphia, to invent his celebrated lens, a representation of which is given in Fig. 11. Here we have two meniscuses, A B and C D, with a stop, S S, nearer the smaller one. The lenses are made of the same kind of glass, and yet counteract each other's errors so well as to produce a very perfect instrument. The leading principles will be better understood from the following drawings: In Fig. 12 let A B represent two plano-convex lenses, exactly alike, and so placed that their outer surfaces form part of an imaginary sphere, A B C D. Then, neglecting refraction for a moment, it is evident that a bundle of rays, *r r*, which the aperture of the diaphragm, D D, allows to pass through both lenses, will be affected only by the little lenses, L, L′, and two blocks of glass having parallel surfaces. Hence, we will get only the insignificant amount of spherical and chromatic aberration due to two minute lenses. The rays, *r′ r′*, passing through the edges of the lenses, A B and C D, will be affected only by the two prisms, P and P′, which will counteract each other, being exactly equal and opposite. For the reason already stated, and on account of the refraction of the rays, the diaphragm is not placed in the centre, but a little to one side. This instrument has a most remarkable depth of focus, and produces most excellent results.

Fig. 11.

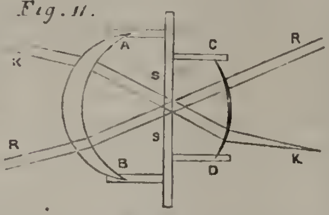
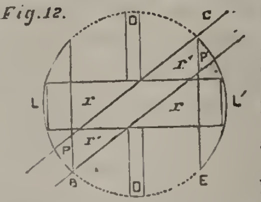


Fig. 12.



To show that any refracting medium—water, for example—could become a lens when made into the proper shape, the lecturer placed a watch glass in the path of the rays coming from a vertical lantern containing a slide of a fine piece of statuary. Nothing was visible on the screen until he poured water into the watch glass, when the image came out with surprising distinctness. The applause which followed this striking experiment sufficed to agitate the water, disturbing the shape of the lens, and destroying the image, which did not perfectly reappear until the water came to rest.

One of the most astonishing effects that a lens is capable of producing was shown by the aid of an instrument called the megascope. This is nothing more than a dark box, having a lens in front and illuminated inside with an oxycalcium light falling on a sheet of white paper in the rear of the box. When the hand is held as close to the light as it can be without burning it, an immerse image in natural colours and startling relief is produced on the screen. The huge proportions of this mammoth hand produced a ludicrous effect when compared with the hand of an assistant standing near the screen. Other objects, such as a plaster cast, a mother of pearl shell, an apple cut in half, and the works of a watch, were then shown with splendid effect. The images of these objects are so large that it is difficult to keep them in focus in all their parts. The lecturer concluded by exhibiting a number of photographs upon the screen, pointing out their artistic excellence and defects in accordance with the principles laid down.—*Scientific American.*

PHOTOGRAPHY IN CONNECTION WITH THE OBSERVATION OF THE TRANSIT OF VENUS AT ROORKEE.

BY CAPT. J. WATERHOUSE, ASSISTANT SURVEYOR-GENERAL OF INDIA.*

Operations on the Day of the Transit.—After the cloudy weather of the previous two days, it was an agreeable surprise when we awoke on the morning of the transit to find an almost cloudless sky. All preparations had been completed the night before, and we were in our places betimes. As the first contact had been computed to occur at about 7 hours, 13 minutes, 7 seconds (mean time), the order for commencing the preparation of the plates was given about 7 o'clock, and the work of the day commenced with the exposure of a Janssen plate for trial of the apparatus. After this two six-inch plates were exposed, and then, about bisection, another Janssen, followed by two more six-inch plates, and then a third Janssen for the first internal contact, for the exposure of which a signal was to be given by Colonel Tennant. Owing to the wet plate prepared for this having slipped off the dipper, a dry plate was substituted, and the plate was mounted in ample time. While watching the image carefully through the red glass, waiting for Colonel Tennant's signal, I noticed that the planet appeared to have passed well within the boundary of the solar disc, though still attached to the limb by a well and strongly defined ligament, so that the planet and ligament were of a distinct gourd-shape exactly like the appearance of the "black drop" one had been led to expect.† On development the plate showed no sign of any such gourd-like appearance, except at the 21st picture, where the clock-work had dragged, and there an image appeared, the exact counterpart of what I had seen.

After this the regular work with the six-inch plates commenced, and went on pretty regular, at the stated intervals of two minutes between each exposure, till about half-past nine, when there was a break of fifteen minutes for refreshment, and to change the chronograph paper, &c.

Though this break may appear long, it had been found more convenient to have one long break than two or three shorter ones, on account of the loss of time in stopping and getting under way again. It was arranged that the break should take place either well before or after mid-transit, so as to be sure of pictures being taken about the time of mid-transit.

It was also arranged that when the signal for the break was given, all wet plates under preparation should be exposed, and dry plates in till all the wet plates had been developed and everything was ready for opening out the doors. In the same manner, after the break, dry plates were sent in until the wet plates were ready. The work then went on as before till the time came for mounting the Janssen for the second internal contact, which was exposed by signal from Colonel Tennant. Two more six-inch plates were then taken, then a Janssen, followed by two more six-inch plates, and last of all a Janssen, about the time of last contact, which was exposed and closed a few seconds before the final contact, thus concluding the work.

The sequence of the plates in the racks was examined, and the plates were left to dry till next day, and then replaced in the plate boxes.

It had originally been intended that 120 six-inch plates should be taken, as it had been found quite possible to do so at the rehearsal; but as I was perfectly dependent on Colonel Tennant's signals for starting the Janssen plates, I allowed plenty of time, so as to make sure of having the Janssen plates ready when required, without hurry; and so only two plates were taken between the Janssen's instead of four, as had been arranged.

The result of the day's work was 109 six-inch plates taken, but of these two failed entirely, so that only 107 can be counted. These are all fairly clean and free from fog or stains, but in many of the plates the images are not so sharp as could have been desired. Though the day was fine and cloudless, there was a good deal of haze, and I think the want of sharpness is chiefly due to this and other atmospheric conditions, as the same faults were observed for two or three days after the Transit.

Of the Janssen plates there were five, which also were, for the most part, clean, good plates, fairly well-defined, though not perfectly sharp.

Several of the photographs show marked irradiation round the planet, and a want of sharpness which may be partly due to the atmosphere of the planet, as the limb of the sun is very much sharper. On some of the pictures distinct streamers are visible round the limb of the planet and proceeding from it. I have not seen anything of the kind mentioned as being observed by other parties, and, as the appearance is not visible on all the negatives, it is no doubt a form of photographic irradiation; but, if not, a comparison of the Roorkee negatives with those taken at other places may throw light on the cause of it.

None of the plates were varnished, as it was considered undesirable to varnish plates intended for future measurement, and also to obviate any chance of the varnished films cracking when removed to England, as is often the case with negatives taken in this country.

With the exception of the want of sharpness of some of the plates, the operations may be considered quite successful as far as the mere photography is concerned. The arrangements described above and the programme of operations answered admirably, and I cannot suggest any improvement. Whether the photographs are sufficiently sharp and perfect in other respects to answer the purpose intended still remains to be seen.

General Remarks.—During the course of the preparations a good deal of time had to be devoted to putting some of the instruments into proper working order, in which work I was much assisted by Captain Campbell, who had charge of the operations with the great 36in. theodolite. Thus for some time the Janssen plates were found to be fogged, and so indistinct as to be almost useless. This was due partly to reflection of light from the polished surface of the wood-work of the slide and the brass-work of the under surface of the exposing disc, which was partially obviated by covering with dead black varnish all the surfaces capable of reflecting light on to the sensitive plate, and partly to the ruby-red glass fixed in the revolving disc not being perfectly impervious to the actinic rays; but this defect was overcome by substituting a piece of thick ruby-glass for the thin, light-coloured piece originally supplied. Even with these precautions, some white light found its way on to the plate between the revolving disc and the wooden case, which were at a greater distance apart than appeared necessary, though the entrance of light might have been prevented by fitting the exposing disc with a flange running in a groove cut in the woodwork of the slide or fastened above it. There was also considerable friction about the internal surfaces, which caused a strain on the clock-work, and gave a good deal of trouble till the cause had been removed. With the exception of these defects, the slide seemed admirably constructed and adapted for the object in view. It remains, however, to be seen how far this ingenious instrument has answered the expectations of its inventor and those who have adopted it; but if it should be used at the next Transit, it would, I think, be desirable that arrangements should be made for the automatic movement to be continued or distributed at intervals over a much longer period than one minute, as on the present occasion, so that all the phenomena attending the contact may be fully observed and recorded. It is also very desirable that the photographer should not require a skilled observer to watch the time of contact for him. The doing so has a very disturbing effect on a man who is able to make a good observation of contact, and time is also lost in preparing and waiting for a signal.

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* Continued from page 410.

† Colonel Tennant remarks, with reference to this :—" There is no doubt in my mind that the outer part of the sun is never free from the result of outstanding astigmatism. For Janssen plates it should have been specially cared for at the expense of the central portion of the picture."

As far as shown by the plates obtained at Roorkee the differences between pictures taken a few seconds apart are so slight, and the advance of the planet is so imperceptibly marked—if, indeed, there is not sometimes an appearance of retrogression caused by atmospheric tremor—that perhaps little would be lost by taking the pictures at intervals of four or five seconds instead of at every second.

The mounting of the slide necessitates the alteration of the adjustments of the telescope for taking the six-inch plates, thus stopping all such observations about the critical period, and it is therefore most desirable that each operation with the Janssen slide should extend over as long a period as possible. Colonel Tennant tells me that the cusp measures are indefinitely more valuable, if good, than any six-inch plates, which he would entirely eliminate. In this case, if it were considered essential that the successive pictures should be taken at intervals of not more than one or two seconds, a second, or even a third, Janssen slide might be provided, so that they might be rapidly changed one after the other. If it were feasible to construct the slide so that the plates could easily be changed without removing the whole slide from the camera, it would be better still, as in that case the observations could be carried on at every second or two, and three or four plates exposed in quick succession during five or six minutes about the time of contact, and, if desirable, continued at regular intervals afterwards; but this appears to present considerable mechanical difficulties, and an arrangement would be required by which the revolving disc could be at once brought into the proper position for exposing the successive plates instead of having (as in the present slide) to be reversed through an entire revolution, which alone takes nearly half a minute.

The photo-heliograph, like all work turned out by Mr. Dallmeyer, was an excellent and perfectly finished instrument, but possessed the rather serious defect, due no doubt to an oversight, or to hurry in turning out the instrument, that the dark slides were much stiffer than they ought to have been. This stiffness of the dark slides was found not to be due to climatic influence, because they did not agree in measurement with the focussing screen, which fitted perfectly, and they had to be filed down considerably before they would fit.

For my part, speaking merely as a photographer, I should prefer the system adopted by Lord Lindsay and the American parties, in which the camera was an immovable fixture, and the solar image retained in a constant position by means of a siderostat carefully adjusted to follow the sun. In any case, the slides should be constructed to fit quite easily into their places, and in this respect the dark slides made for the equatorial camera used at Dodabetta for photographing the solar eclipse in 1871 were of a much better pattern than those sent out with the photo-heliograph.

(*To be continued.*)

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HALF-TONE PICTURES.*

In last month's number of the *Notizen* appears a hearty warning to photographers against the purchase of secret processes, and especially those which relate to the production of the so-called mezzo-tint or half-tone pictures, that went some time ago by the name of brilliant photographs. By chance the matter has become to me particularly interesting, for I have succeeded in getting an insight into the manner in which some of these things are managed. I have recently been offered the purchase of the method of Plasto-photography, with the remark that it was patented in Austria.

In the Austrian *Year-Book of Photography*, issued by Professor Hornig, there appears an advertisement to this effect:—" A. Hommel's Patented Process, at home and abroad, for Plasto-photography. A new process for the production of perfect photographic pictures, &c." And then, farther down, appeared a threat to the effect that if anybody would give information of the patent being infringed, the sum of one hundred marks would be paid to the informant.

I should like to be informed whether a patent has really been granted by the Austrian government to M. Hommel for his plasto-photography, for, as it appears to me, he is only at present expecting one. Dr. Vogel, to whom we are indebted for many cautions, writes to me that there is no such patent existant in Prussia. In any case, I am in a position to tell your readers the details of the Hommel secret. In the advertisement it is said that " The process is based upon a simple manipulation in practice, which produces a perfect negative, so that no artistic aid is required in the printing process."

If this is so far correct, the Hommel method can be little different to that already published by Dr. Székely, who superposes one negative over another, and then prints; and two of my colleagues, who have apparently been trapped by the advertisement, tell me that M. Hommel simply coats both sides of a plate with collodion, which is then prepared and treated in the ordinary way. This is easily done with a little skill and practice. The sensitizing can be done in a flat porcelain dish to prevent damage to the back of the plate. The spring in the dark slide must, of course, be removed, and to render the plate firm, it must be pressed at the side with strips of rubber. During exposure the light penetrates, to a certain extent, through the first film, and acts upon the second one. In this way a double plate is secured, which must, of course, be developed on both sides, the best way to do this being to employ a dish.* This is all I know about the process. Whether it is worth a trial, I cannot say. The results shown by Hommel himself are not of such a nature that they would lead one to follow his example. It is possible by placing a sheet of gelatine between a negative and the paper in the printing-frame to produce far superior brilliant photographs, and without all those disagreeable operations which are necessary in the production of a double picture. We have, I contend, methods already of producing brilliant pictures better than those obtained by M. Hommel.

Whether, however, this particular kind of photograph is, after all, to be recommended, is to me a question. I may call to mind the finest examples of the sort, those of M. Denier, of St. Petersburgh, exhibited in Vienna in 1873. Were these pictures received with universal approval? I do not think so. Many were loud in praise of their beauties, while others, again, talked of their wax-like appearance. I know many colleagues who have produced such pictures, and very successfully, too; but they have given up the process again after a little while. The particular plan adopted by Denier has not yet been published, but I had it from a St. Petersburgh photographer, who seemed a well-informed man, that it was brought about by the use of two negatives which were placed one above another.

Nevertheless I hold that photographers, and my younger brethren especially, would do better to eschew all such dodges, and devote themselves to improving themselves in art matters. Those who cannot pose and manage the illumination of a model will never be able to do anything with the aid of the mezzotint or any other process. How few, however, among us have received any art education! Operators who are efficient in the technical manipulations that are necessary, and who can produce clean plates, are to be found in any number; but one who can pose properly is difficult to meet with. "I teach my own people," said a proprietor of a large studio to me; "they must engage to remain with me three years. In the first they learn, and in the second and third they are of use, provided they take pains; but the posing and lighting of the sitter I always manage myself." In truth, I soon after met with one of the young people who had passed through my friend's establishment, who was exceedingly skilful so far as the technical part of his work was concerned, but whose artistic capacity was exceedingly small.

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* *Photographische Notizen.*

* Such a process was published in our pages years ago. A leader in type, which must stand over until next week, gives fuller details.—Ed. P. N.

A third person is injurious in the duty of posing, and therefore there is only one way to impart instruction, and that is by the formation of a photographic art school, respecting which this journal has striven for the past eight years. It is said that with the operators whom we have there is no need of such an establishment. This is no argument. If a few young people were adequately trained in art knowledge in such an establishment, one might safely bet a thousand to one that they would at once get good engagements—far better, certainly, than the ordinary operator or retoucher of the present day. There should be no lack of means, for some of our operators are so well paid that they could easily save enough for their studies from one year's income. If only such an institution were set going, its beneficial influence would soon make itself apparent.

A TRIP TO THE HEBRIDES.

BY REUBEN MITCHELL.[*]

The island of Skye is about forty-five miles long by twenty-four in breadth, with a coast varied from flat, shingly ground, covered with bright-coloured sea-weed, to the wildest rocky cliffs. The island abounds with wild mountain scenery. The Cuchullin Hills are the most interesting, and vary in height from two to three thousand feet above the sea. There is excellent fishery; fine salmon was selling at Portree for sixpence per pound. Sea trout and herrings are very plentiful—the former in the river and burns on the island, which afford amusement and sport for visitors. The curious and picturesque abound in every direction, sufficient to satisfy the most fastidious. After spending about three weeks on the island, I was very sorry to leave, though I had exerted myself very much not only to see, but to bag as many sketches and photographs of the truly grand scenery as my limited time would admit; and I hope to exhibit in miniature to the Boltonians what I had the pleasure of seeing in nature. Portree is not interesting, but rather disappointing. On landing, it has the advantage of a pier, or landing-stage, and is so far superior to Broadford, which must be reached from the steamer by ferry boats. Our first excursion was to the Storr Rock, about seven miles from Portree. It is more curious than picturesque. One isolated piece of rock, called the "Old Man of Storr," stands entirely aloof from the other parts, and projects a considerable height above the ground, and on a fine day can be seen at a considerable distance. We made a sketch, as it is a difficult place to get the camera to it. About three miles of the road is little more than a sheep track. Returning to Portree, although the morning had been fine, it came on a wet, drizzling rain, and kept us inside for the rest of the day. Next day again wet, nothing to be done. The following morning being fine, we made a further inspection of the surroundings of Portree along the shores of the bay. In one part a shallow and shingly beach is covered with sea-weed, and with numerous fishermen's cottages, some of them very picturesque both outside and in. We sketched and photographed several, and we were allowed to inspect two of their interiors, which were very primitive, a stone flag doing duty for a fire-grate, with a few pieces of peat, an excellent substitute for coal, for boiling the pot, which is suspended from the roof by a chain. One of the cottages had a workshop attached for boat-building, all of the most simple and primitive character; this is a very picturesque group, but the gude wife would not allow us to see the interior, some of them having a strong objection to having their interiors painted and made into pictures, for fear of being treated with ridicule. It would be well if tourists visiting these out-of-the-way and simple-minded people and their dwellings would spare their feelings by treating them respectfully, and not by jeering and making fun, as some call it, which I have been told is the reason of the refusal to allow tourists and artists to see or paint the interior of their cottages. Leaving the shore, and crossing to the east side of the town, to a beautiful waterfall, surrounded with trees, we fixed our camera, but there being considerable wind, I commenced to sketch in water-colours. During our stay a party of ladies and gentlemen made their appearance with a camera. They exposed several plates on the falls regardless of the wind. Inquiring of me what I was waiting for, I told them I was waiting for the wind to cease before attempting to expose. They were a yachting party, and combined photography with yachting as a part of their pleasure trip to Skye. I finished my sketch, and we each exposed a plate. The wind having considerably abated, we next exposed plates on Portree Bay, which makes a very good picture from the shore. We returned to our hotel in time for dinner, 4.30, after which we arranged to go on to Sligachan.

Next morning we called at the Portree Hotel, to secure places for ourselves and our formidable luggage. Mine host of the Portree requested us to have our luggage at the omnibus by eight o'clock a.m., which was timed to start at nine o'clock, but was not punctual. We were in attendance shortly after our luggage. To our astonishment, when the 'bus made its appearance it was a one-horse car, just room enough for four. Mine host looked at us and then at our luggage. I suggested a larger conveyance; so after trying how some of the boxes would do on the small car, and finding it would not do, he brought out a larger two-horse wagonette, a very smart turnout. All was soon arranged, and ourselves and two others seated, we were on our way to Sligachan, 9½ miles, on a very good road. When we had left Portree a few miles, the road became very interesting—a wild moor and mountain background, tumbling burns or streams, swollen by the recent rains, with a sinuous river, with here and there small falls. It commenced to rain at intervals, but the face of the country was very pleasing. On nearing the high ground, before descending to Sligachan, such a grand view burst in sight, which made such an impression I shall never forget—the Cuchullin Hills and other mountains in picturesque confusion; Scuir-na-Gillean dark and frowning, and partially capped with clouds, the river, lake, and burn, all making one grand panorama of nature. The small, unpretending inn or hotel nestles in the valley amongst all the most lovely scenery I ever beheld. We were soon at the hotel, mine host, Mr. Butters, in attendance, looking to our party, and soon our arrangements were concluded for a stay of some time. Inquiring what we had to pay, the reply was 3s. each, 3s. each for luggage, and 2s. for himself, making in all 14s. Our intended bedrooms were not then at liberty, so we were shown into a temporary one, had a refreshing wash, and turned out to look about us.

Bolton, August, 1876.

(To be continued.)

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[*] Continued from page 417.

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The Photographic News.

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YELLOW SPOTS ON PRINTS.

There is no trouble more frequently besets the silver printer than the frequent recurrence on batches of prints of minute yellow spots. Sometimes they are seen whilst the prints are washing, sometimes not until dry, and sometimes not until the prints are mounted. The chief difficulty is that such spots, very similar in appearance, spring from different causes. We have hunted down to their source several forms of these spots, but there are still some the causes of which elude detection. Amongst the most common causes are the formation of minute air-bells on the print while it is in the hyposulphite solution, causing a spot of imperfect fixation; the use of cards with bronze printing, the loose particles of bronze causing spots where they come into contact with the print; and the use of albumenized paper which has long been kept in a damp place. One case, which for a long time defied detection, was traced to the burning of a coke stove in the printing room, and they disappeared on getting rid of coke and the sulphurous particles it gave off. Another suggested cause has just been brought under our attention by Messrs. Marion and Co. The use of acetic acid in the water in which prints are washed has been found to produce such spots. The use of a little acetic acid in the water for washing the prints, prior to toning, is almost universal in America; but it is not, we believe, very common in this country. We shall be glad to learn if photographers who so use this acid suffer generally from these spots, as a general consensus of opinion only can establish the fact. Of course, no one would dream of adding acid to the washing waters after fixation, as such a course would lead directly to the instability of the print. We append Messrs. Marion and Co.'s letter, for which, if it tend to elucidate the cause of this trouble, all photographers will be indebted to them.

"Dear Sir,—We do not doubt you have heard a good deal of yellow spots coming out in a thick rash on the print, even sometimes a few days after mounting. We have not only heard, but seen, a good deal of this, much to our cost, as our publication drawers are unfortunate witnesses to. Besides this bother, we have had photographers imputing to our mounts the guilt, which we have always protested against, having thoroughly and repeatedly tested them without finding in them any destructive agent. To-day two photographers came in and said they had found out the *cause*, which, according to them, was the adding of glacial acetic acid to the water in which the prints are washed. Now whether this is new, correct, or fudge, it is not our province to say, nor does our knowledge enable us to form a judgment.

"We thought if it was a new idea it might be worth your attention, and if proved to be correct it would be a great boon to all photographers to be informed of it.—Yours very truly, "Marion and Co."

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THE POSSIBILITY OF EMPLOYING THE CARBON PROCESS IN PRODUCING PHOTOTYPES IN ZINC.

Some experiments have recently been undertaken by M. Georg Märkl, of Vienna, with a view of utilizing the carbon process for the production of phototypes in zinc. Pigment pictures produced upon zinc will not withstand the action of an etching liquid, for the weakest of these, it is found, will swell up the gelatine film, and so render strokes, or lines, much broader and thicker than they should be. But M. Märkl, it appears, has made an experiment which deserves at any rate to be mentioned, in which he does employ ordinary pigmented tissue, and he has no doubt, he tells us, that successful results may be secured by its use in this direction.

His plan is to coat a zinc plate with asphalte solution, and to develop upon this the exposed pigmented tissue. In all those places where the surface of the pigment paper has been exposed, there is to be found insoluble gelatine, which remains covering the film of resin on asphalte. In the other parts (for we are talking of a black and white picture) the asphalte is quite uncovered and naked.

If you have exposed under a negative, the image obtained forms a protection to the asphalte film, and when a solvent is applied to this film, only that portion of it which is bare is attacked and removed. The result is a zinc plate, upon which an image has been formed by a film of asphalte, and this zinc plate can be subjected at once to the etching process, and a phototype in this way produced. It is immaterial, of course, what becomes of the pigment image as soon as the asphalte outline has been formed.

◆

ROYAL CORNWALL POLYTECHNIC SOCIETY.

The 44th Annual Exhibition of this Society opened on Tuesday last, and the photographic section fully maintained its prestige, a most valuable and instructive collection of pictures having been brought together, a review of which in detail must be deferred until next week.

Although the report of the Judges has not as yet been handed in, they have, we understand, made the following awards :—

Geo. Cooper & Co. (Hull)—A first silver medal, for portraits from life (17 by 23).

Geo. Nesbitt (Bournemouth)—A first silver medal, for portraiture (10 by 12).

Brown & **Barnes** (Liverpool)—Second silver medal, special prize for a paper negative, waxed (printed from an enlarged transparency), and the print from it; and a first bronze medal for vignetted enlargements (20 by 24) on opal glass.

A. **Ford Smith**—A second silver medal.

Benjamin Wyles—A second silver medal.

A & J. **Bool**—A second silver medal, for their view "On the River Womble."

E. P. **Lee** & Co. (Cardiff)—A second silver medal, for frame of ceramic photo-enamels.

W. **Widger** (Torquay)—A first bronze medal.

W. D. **Sanderson** (Manchester)—A first silver medal, for "A Trout Stream" (dry process).

In the Amateur Department, Mr. W. J. A. **Grant** obtained a first silver medal for "Tree Studies."

Mr. H. W. **White**—A second silver medal, for a large and magnificent collection of photo-ceramic enamels.

Mr. R. O. **Milne**—A first bronze medal.

Mr. H. A. H. **Daniel**—A second bronze medal.

ENAMELLING AND RETOUCHING PHOTOGRAPHS.*

The question has often been discussed as to the relative advantages of matt and glazed surfaces for photographs, and in relation to large pictures it still remains a moot point. But in regard to small pictures, the answer has long since been practically given. All photographers aim to secure a highly-polished surface, at least, on card and cabinet portraits. Rolling, burnishing, and enamelling, each has its advocates; but the general verdict is in favour of enamelling, where it can be easily and successfully managed. There can be no doubt it adds at once delicacy and brilliancy to the picture: detail is made to "bear out" which was scarcely visible before; shadows acquire new depth and transparency, without any lowering of the lights, the scale of tints being actually extended. The practice of glazing pictures by means of gelatine prevailed before the days of photography, plate glass rubbed with oxgall, and then coated with a thin layer of gelatine, being used in securing the brilliant surface. This method was tried upon photographs, but the surface had the fatal defect of readily marking and soiling when handled in damp weather. The happy idea of using a film of collodion to protect the gelatine from moisture came to us from Germany, and was first published in this country in our pages, in a letter from our friend and collaborateur, Dr. Paul Liesegang, about sixteen years ago. Certain it is that if a finely glazed surface be desired, the method of enamelling with gelatine and collodion gives the very best which can be obtained, and as it supplied a protection not easily permeable to moisture or air, it is likely to conduce to the permanency of the print.

The general adoption of the plan of enamelling has, nevertheless, been somewhat tardy, chiefly, we believe, because the successful application of the process has not been found easy in the hands of many who have attempted it. Success in the operation depends on attention to many minute points, and although many articles have been devoted to detailed descriptions of the process, it often happens that the expert in writing on the subject never dreams of mentioning a multitude of minor points which come so natural to himself that he is scarcely conscious of them, which are, nevertheless, of vital importance in successful working. It is here especially that the little volume before us will be found essentially useful. Mons. Piquepé has a special mode of working, it is true, which conduces to success; but the minutely detailed and lucid description of each step which his little work contains gives the especial value to his publication. That he is a perfect master of his craft we know from examination of specimens of his work, which are very perfect examples of enamelling; but the capacity of teaching is quite distinct from skill in manipulation, and Mons. Piquepé possesses both in an unusual degree. As one point of chief value of the volume rests in the minutely full detail of the instruction, it would be idle to attempt a summary of its contents. The reader will discover that success in the process of enamelling depends on following out with care and precision a definite system, and that any attempt at haste or "scamping" the work must be fatal. Take an example in the chapter devoted to

"Preliminary Coating of the Plates.

"Till now it has always been thought that what gave brilliancy to the surface of the enamelled print was the collodion, gelatine being only employed for fixing the prints and the cardboards on the plates; and it was thought that the thicker the collodion was used, the more solid and brilliant would be the layer. But this is not the case, as, whether it be thick or thin, the surface of the collodion pellicle remains the same—its thickness does not increase its brilliancy or its strength, for, as everybody knows, it is essentially fragile. It makes creases and lines under the action of damp, and these creases cause it to lose much of its transparency. Therefore it will be easily understood that by increasing the thickness of the pellicle these wrinkles or lines will become deeper and more visible, and the brilliancy and transparency of the prints suffer still more. This it is impossible to avoid, except by giving to this delicate pellicle a substance stronger than itself to support it, and which, by its strength of tension, will prevent all these irregularities. Therefore—to repeat what I have already said—the collodion should be used as fluid as possible, looking upon it only as a temporary support to the prints between the moment when they are put down upon the plate till they are taken off again—support which it is impossible to do without, as it prevents the gelatine from adhering to the glass. The collodion certainly plays an important part; but it does no more than this.

"From what I have said it will be seen that the collodion pellicle will be brilliant and strong in proportion as it is reduced to the thinnest possible state, and the supporting substance made stronger. Gelatine employed in thick layers, as I shall describe, fulfils perfectly the necessary result.

"Filter the gelatine through very fine linen into a bottle strong enough to stand heat, and, having filled the bottle up to the top, wait a few minutes till all the air-bubbles have come to the top, and then blow them all off. Then have a very clean dish on a level table, and raise up one end of the dish by means of a piece of wood, or anything else, put underneath; pour the gelatine into it very slowly, so as to avoid air-bubbles, which it would be then impossible to turn away (this may be done by pouring in against one side of the dish), and fill it till the liquid just covers the bottom of the raised end. In this way there will be a bath of about one inch at one end and one-sixth of an inch at the other. Then take one of the collodionized plates by a corner in the left hand, lay the bottom of the plate into the raised end of the dish, and having in the right hand a silver or ebonite hook with which to hold the top of the plate, lower it slowly till the liquid has covered the whole surface, not allowing any of the gelatine to get on the back; then lift up very slowly, taking care that the hook does not scratch the collodion, and, after having drained it for a moment, lay it flat on a shelf well protected from dust, and proceed with the others in the same way. This operation must be done in a good light, and very slowly. This latter point is of great importance, as if the plate is lowered into or taken out of the gelatine too quickly, air-bubbles would be formed on the liquid, and would stick to all the plates afterwards. The dish must be kept always with about the same quantity of liquid in it, and must be replenished by a little at a time out of the bottle, which will be kept hot in a saucepan of hot water. If these instructions are closely followed the result is infallible, and perfectly level films will be obtained.

"I should not advise the use of a brush in this operation, as the result is not so good. Either hairs come out of it, or the collodion may get scratched by it, and there is generally a want of evenness in the film.

"This may appear difficult at the first trial, but is really very easily done, and only requires a little care and attention. The plates are then left to dry in a warm room for ten or twelve hours. When quite dry, store them in boxes for use; they will keep good for a long time.

"A quart of gelatine will coat 250 plates and what is left may be put aside for future use. This one coating is sufficient to give a very brilliant effect to the print, and will be strong enough to hinder the collodion wrinkling. It also gives a very solid surface, so that it will be very easy to rub and squeeze the prints on it without fear of scratching the film, which would render very long and difficult the following operations. But, if required, the plates may receive two, three, or even four successive films of gelatine leaving plenty of time to dry between each coating. The greater the number of films the plate receives, the greater will be the depth, strength, brilliancy, and delicacy of the enamel."

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* Practical Treatise on Enamelling and Retouching in Photography. By P. Piquepe. (London: Piper and Carter.)

Thus much on preparing plates which may be kept ready for use. The instructions for placing the prints on the glass, and carrying out the further steps, are just as minute, and it will be seen that if the operations are carefully followed, a very perfect surface must be secured. We extract a portion of the instructions:—

"Put to soak—

Gelatine ... ... 150 parts
In water ... ... 2000 ,,

and leave it for several hours, stirring every now and then, and melt in a saucepan. I give here the exact method in which I work myself, and which appears to me to be the most convenient, especially where there are a great number of prints to be enamelled at a time. Everything should be put beforehand in its place, so that the work should proceed rapidly and with certainty; for I may say that a proper method in working is invaluable.

"Put on the left-hand side, and within reach, the box containing the collodionized and gelatinized plates; near this box have an empty rack for the plates, with the prints on them to be put into. In another place, put on a hot stove, a large and deep tin dish full of water. The dish will have two handles, to be removed with facility. In the hot water in this dish stand two little clean porcelain dishes, one alongside of the other. Have a little sponge always ready in the hot water, and a squeegee. Filter the dissolved gelatine into these two little dishes, taking care to avoid air-bubbles as much as possible. Immerse a certain number of prints in the right-hand dish; then take one of the plates, and lay it, with the collodionized side in contact with the gelatine, in the left-hand dish, which is kept specially for this use. Raise the plate immediately, so that the preliminary pellicle shall not become softened, and lay the prints with their faces on the collodionized surface, holding them in their place with the thumb of the left hand, and with a squeegee rub (not too hard) on the back of the prints, to get rid of the excess of gelatine and bubbles. Turn up the glass; wash it over with the sponge to make sure that there are no bubbles left; if there are, rub again with the squeegee till they are gone; then put the plate to drain in a rack. This operation should be done quickly, so as not to give the gelatine time to coagulate before having driven out the excess of it with the squeegee. You must not forget to dip the plate into the first dish of gelatine before putting the prints on the film, as otherwise the prints would stick immediately, and it would be impossible to get rid of bubbles. Continue in the same way till all the prints have undergone the same operation, and put the plates one after the other in a rack, of which the grooves should be very wide, so as to avoid rubbing the pellicle, which is very soft and tender at this stage. The liquid should not be too hot, or the prints will be sure to turn yellow; therefore, when necessary, lift the dish off the stove and stand it on a table for a time.

"A plate 6½ by 4¼ will take easily two card-sized prints, or one cabinet. For larger sizes than this I would recommend only to put one print on each plate. It is also advisable to have a squeegee for each size of print, so that the excess of gelatine may be removed from the whole surface by one operation, and with more regularity. The size of the squeegee should be the same width as the enamelled print.

"We have now to think of placing at the back of the prints the cardboards by which they will be supported. A Bristol board not too thick, and well rolled, is required for this. Reverse the rack, and begin with the first plate. The manipulations are somewhat the same as before. Immerse the cardboards in hot water to soften them; then dip them in the dish of gelatine in which the prints were placed; take one of the plates, lay a cardboard on each print, hold it down with the thumb of the left hand, pass the squeegee over it, and lay the glass flat on a shelf to dry. This operation is, it will be seen, much simpler than the first; but some precautions are necessary to insure complete success.

"The cardboard must always be cut a little smaller than the print. This is a most important point, as it prevents the enamelled print coming off the plate too soon. If the mount were ever so little larger than the print, even only on one side, the result would not be successful. In fact, the cardboard, softened by the hot water and the gelatine, yields very readily to the pressure of the squeegee. It adheres as firmly to the surface of the plate as to the print; but as soon as the gelatine begins to dry, the card resumes its original flatness, the print begins to force up its edges, and it brings with it the pellicle of gelatine and collodion, which thus becomes partially detached in that spot. It would be otherwise if the mount were large enough to touch the albumenized line beyond the print, as then it would be firmly held by the collodion, and could not detach itself.

"The safest plan, then, is to cut the mount smaller than the print. It will never detach itself, but will require to be cut off.

"If the mount extends beyond the print, be it ever so little, in that spot it will begin to peel off.

"If it extends all round the print for about one-sixth of an inch, it may be safe; but even then it will tend to come off if the talc has not been removed from the edge, or if the albumen line is not continuous.

"It is, therefore, better to enamel the prints before trimming them, as there will be then always a margin to allow for the mount being a little smaller. If it be necessary to enamel prints that have been already trimmed, put behind them one mount cut to the size of the plate, so that the edge shall come in contact with the line of albumen.

"If at any time, being well accustomed to the work, one was, perhaps, short of glasses, one might trim the prints, putting three on the plate instead of only two, two lengthways and one across, covering all three, as I have just described, with one mount same size as the plate; but I would only advise this in exceptional cases, as it is a somewhat difficult operation.

"For large prints, even whole sheets, the working is just the same, only as it is impossible to hold such large plates in one hand, this is the best method to follow: put on a table a dish much larger than the plates, lay flat in the bottom of it the plate which has already been dipped in gelatine, lay the print on it, and pass the squeegee, beginning from the centre. The dish will receive the excess of gelatine without puddle round the body; the plate will be better able to resist the pressure of the squeegee; the bubbles more certainly driven away. For large surfaces I advise at least two layers of gelatine on the collodion, so as to gain more strength and brilliancy."

Every portion of the operations, from choosing and preparing the glass to mounting the print without losing its gloss, is as fully and as carefully given; and all photographers who ever enamel their prints will profit by a study of the book.

On the subject of retouching, both negative and positive, Mons. Piquepé is as minute and lucid in his instructions, dealing with all kinds of surfaces for retouching, and how to produce them, and with the various kinds of pencils and pigments used in the work, as well as in the modes of using them effectively. The work worthily fills a hiatus in photographic technical literature, and well deserves a high success.

Critical Notices.

THE CHEMISTRY OF LIGHT AND PHOTOGRAPHY, in their Application to Art Science and Industry. New and thoroughly Revised Edition. By Dr. Hermann Vogel. (London: H. S. King and Co.)

The volume before us is in many respects one of the most interesting works which have been issued in connection with photography, and differs in many respects from any previous volume connected with its subject. It is historical, descriptive, and technical; but each phase is broadly and philosophically treated. It is not technical in the sense of constituting a practical hand-book, but it is sufficiently precisely and scientifically so[*] to satisfy the practical photographer, without becoming tedious or perplexing to the intelligent but uninitiated reader, to whom its historic and descriptive character will prove full of interest and instruction. Whilst, however, the work makes no pretension to the character of a technical manual, it furnishes an admirable treatise on all phases of the chemistry of photography, and presents a most comprehensive and valuable record of all the most recent and extended ramifications of the art and its applications, which will give the work especial value to photographers generally. The various phases of permanent printing and photo-mechanical printing processes are very fully treated. An admirable feature of the work is the excellence and copiousness of its illustrations. Besides many series of wood engravings, there are several capital examples of the different processes of photo-mechanical printing, of which a copy of Mr. Rutherfurd's photograph of the moon, four inches and a-half in diameter, is not the least valuable.

BRITISH MANUFACTURING INDUSTRIES. Edited by G. Phillips Bevan, F.G.S. (London: Edward Stanford.)

The volume before us constitutes one of an extensive series devoted to descriptions of the various manufacturing industries carried on in this country, the volume recently issued being devoted to "Paper," "Printing and Bookbinding," "Engraving," "Photography," and "Toys." The essays or sketches are chiefly historical and descriptive, and although all interesting and well written, they are all open to the charge of being somewhat useless. The space devoted to each subject—there are five in two hundred small pages—admits of little more than a hasty sketch. It is too brief for comprehensive history, full description, or technical details of practical value. The article on photography is written by a gentleman fully conversant with its history and practice; but in the less than thirty pages devoted to the subject, consisting of little more than three pages of this journal, it was manifest that in dealing with the whole subject of photography and its applications, from the time of Wedgwood to the present time, the merest glance at its history and present aspects was possible, without entering into detail of any kind. Mr. Foster, who has, under these difficulties, written an interesting essay, concludes by remarking that it must be "taken simply as a sketch of the general bearing of photography on the arts." For such a sketch of the industrial applications of photography, at least the whole of the volume, instead of a fifth part, would have been required to render it even approximate justice.

EVERY MAN HIS OWN PHOTOGRAPHER. Liverpool Dry Plate and Printing Company.

This is a useful little manual of instruction for the special use of non-photographic tourists, furnishing them with complete instructions for producing photographs of scenes of which they may wish to preserve records, by the use of materials prepared ready to their hands. By means of the dry plates or the emulsion supplied by Mr. Mawdesly, the uninitiated, following the clear instructions here given, will find little difficulty in producing negatives which may prove a perpetual source of interest and satisfaction to themselves and friends.

THE PRINCIPLES AND PRACTICE OF PHOTOGRAPHY FAMILIARLY EXPLAINED. By Jabez Hughes. (London: J. Werge.)

This is the eleventh edition of Mr. Hughes' excellent and very comprehensive manual. As edition after edition has been called for in something like annual periods, opportunity has thus been afforded for keeping the work abreast with the progress of the art. In the edition before us almost every process a photographer is ever called upon to practise in the course of his business, if a professional portraitist, or of his pleasure, if an amateur, is very fully described, not in general terms simply, but in the minutest detail, and with the latest improvements, rendering the work what it is clearly intended to be—a thoroughly trustworthy hand-book of the art as it is practised at the present moment.

PRACTICAL PORTRAIT PHOTOGRAPHY. By Wm. Heighway. (London: Piper and Carter.)

The manual before us consists of the series of lessons in portraiture which recently appeared in our pages, a circumstance which necessarily makes us more reticent in speaking of their merits than we otherwise should be. We may state, however, that the lessons are those of a skilful practical portraitist, who has graduated in this country and America, and has here given the actual result of personal experience and observation in place of the mere compilation only too common in producing hand-books. The instructions enter minutely into every department of the duties of a portraitist, and are as lucid as they are trustworthy.

ON THE STICKING OF CARBON PRINTS TO THE TEMPORARY SUPPORT.

BY W. E. BATHO.

In the early days of our art, when pictures on albumenized paper were a novelty, troubles presented themselves incidental to this method of working, until then unknown. Perseverance overcame these difficulties, their causes were ascertained, and the knowledge gained enabled its possessor to avoid such evils in the future. This, however, took time; yet to-day formulæ as varied as the religious opinion of mankind, and all of them yielding good results, are in existence for the production of silver prints. To-day a process is before us that makes, as a special claim, "permanency." Comparatively, this new method of printing is in its infancy, and notwithstanding the rapid progress that has lately been made therein, much remains to be accomplished before it will seriously compete with its more generally practised rival. Every difficulty pointed out, cause given for the effect, and the means to avoid it shown, must have a tendency to bring into more extended practice any process troubled with such difficulties. It is proposed to give what is the cause of the difficulty indicated in the heading of this article, and the remedy for such trouble. Perhaps at some future time (should such be acceptable) a similar course will be taken in reference to a defect some deny the existence of (reticulation is referred to), yet which I have never seen absent in a carbon print developed on, and transferred from, a rigid support. This defect at one extreme causes a decided loss of sharpness in the print, and at the other requires a close examination to detect the evil; but in either case an evil it certainly is, causing a marked loss in depth and purity of tone.

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[*] We may here remark that the edition before us is, as it is described, a new and thoroughly revised one. A former issue of the work, some months ago, was defaced by errors, evidently arising from want of technical knowledge on the part of the translator, which must have been eminently unsatisfactory to the author, and in deference to our regard for his reputation we did not notice the work. The speedy re-issue in a corrected form is highly creditable to the publisher.

A brief notice of the operation directly involved in the successful transfer of a developed print from its support, with the exclusion of minor points, will be of use. The support is smeared with a waxing compound, the object being to prevent permanent adhesion of the picture to its support. It is obvious that unless the support be covered with the wax the picture must be permanently attached to the unwaxed portions, and hence a defective transfer ensues. Herein lies the cause of failure. That the smearing with wax is done in an imperfect manner it is difficult to imagine; indeed, it is in a subsequent operation that the wax is removed, and to this I must call attention. Beeswax is a complex substance, the constituents of which are not all soluble in the same menstruum. If ether or benzole be used as solvents for waxing purposes, to wash the plate after waxing with either of these bodies would remove the wax. In collodionizing this is sometimes done, and it is to the solvent powers of the ether, which forms part of the collodion employed, that failure is to be attributed, and not to imperfect waxing, horny or powdered gun-cotton, or setting of the collodion.

Now to the remedy. Alcohol is not so perfect a solvent of beeswax as either benzole or ether, hence an alcoholic collodion prevents all sticking occasioned by the solvent powers of the ether in collodion. That there is a limit to the amount of alcohol that can be employed in the manufacture of collodion is well known, but an approach to this limit will secure perfect immunity from any solution of the wax on the plate, and your readers will find it to be a sure means of avoiding the sticking of carbon prints to the temporary support.

A few words will be permitted on the question of permanency. It certainly is true that some of the pigments used for tissue making are fugitive, but such is not a defect inherent in the Autotype process: a more careful selection of pigments, guided by experience, will avoid this. Yet, after all, what do we want and mean by permanency? In the absolute it has no existence. To-day, we strive to make images of ourselves immortal. The ancient Thebans endeavoured to preserve their bodies. If they come again (as they believed) for their remains, won't they stare at their preserved meat? And in a short century an equal surprise would await a revisit by us to this world of ours. Like the life of a drop of spray, glittering in the sunshine, ends with its fall into the ocean, so end the fame and glory of most men with their fall into the wide wide sea of eternity. Whatever we think of ourselves, posterity may hold a different opinion, if, indeed, it will hold an opinion at all. Permanent pictures will only be of service to the few who immortalize the million in this way, and the probability is that posterity will revenge itself by selling the productions as waste paper.

THE PRODUCTION OF PHOTOTYPE AND PHOTO-LITHOGRAPHIC WORK.

BY G. MARKL.*

In producing pictures that will etch, it is a question principally of obtaining an image which will withstand the etching material in a most perfect manner. Such images are—1, resin pictures; 2, pictures obtained by the reduction of metal compounds; and 3, pictures of a greasy nature, which likewise, by dusting with powdered resin, may be rendered perfectly impervious to the etching liquid.

Resin pictures may be obtained in three different ways; namely, by the asphalte method, by the dusting process, and by means of resin in conjunction with chromium salts, when the employed resin loses its solubility wherever it has been attacked by light. By this method it is necessary to obtain a medium wherein to dissolve the resin which will at the same time combine with the chome salts, and for this reason neither the ether, oil, nor alcohol can be employed. The best solvent should be ammonia, the resin methods, as also those by means of which the images produced by the reduction of metal compounds are secured. Daguerreotypes are processes which are rarely employed now-a-days. On the other hand, the indirect processes find more applications every day, as the work is more quickly conducted.

In the indirect methods the pictures are produced upon prepared paper, which, after exposure, is blackened or inked, and developed, so that the colour is only held fast in the exposed parts. In the preparation of the paper gelatine, albumen, starch, and gum, have till now been employed, but none of them give very satisfactory results. For instance, although very fine lines may be obtained upon albumenized paper, it is difficult to keep the ground work clean, as the paper is easily rubbed, and the colour then attaches itself to those parts. These and other grave defects I have been able simply to overcome by having recourse to a double film upon the paper.

This double film must have two qualities. In the first place, the upper film must be capable of being washed off with cold water, while the lower one remains adherent to the paper; and, secondly, both films must possess sensitive properties. The upper film is composed of albumen, the lower one of gelatine. I produce the upper film, during the sensitizing process, by floating a sheet of gelatinized paper upon a solution made up of—

Albumen	50 parts
Water	50 ,,
Bichromate of potash or ammonia...	7 ,,

The paper is allowed to swim on this liquid for a period of five minutes.

After the paper prepared in this way has been dried, I print until the exposed parts have become brown, and then I blacken or ink the surface before it is washed.

The inking is brought about by the aid of a brush which applies the colour thicker or thinner, according to desire. The colour itself I mix from one part transfer ink and three parts chalk ink, which is worked up with as much oil of turpentine as will render it even and uniform for painting. The colour is applied to the paper, and then, with a tuft of cotton wool, I equalise the surface and remove what is superfluous. When the oil of turpentine has completely evaporated I proceed to develop.

The development is carried out with cold water, the paper being allowed to swell for twenty minutes in water first of all, after which time the ink from all portions of the surface, excepting that which has been exposed to light, comes off with the greatest ease. The ground is quite free from ink or colour, for only where the light has acted are the superposed films firm, and consequently the ink adherent. The cold water produces a clear image in fatty ink upon a clean ground, which may be transferred to a lithographic stone or a fine plate, and etched as usual.

Correspondence.

PHOTOGRAPHY ON BOARD SHIP.

S.S. "Whampoa" (Lat. 45·10 S.; Long. 64·11 E.),
June 30th.

Dear Sir,—When I sailed from Plymouth on this ship, I had no idea I should find any matter of interest to your readers on the voyage, the idea of carrying out photographic work on a steamship never having occurred to me. I have, however, to report to you some very interesting work done with the camera on board, and that, too, in the winter time, when the light and other conditions were not the most favourable.

You will see by the ship's position I have quoted, that we are now making that long easterly run between the Cape of Good Hope and Melbourne, so that we are only a few days past midwinter. The weather is very cold, but unusually fine for this time of the year. Just after we had passed the Cape, and so got out of the really fine weather, I found that one of the mates had a small camera on board, and that he wanted to try and take some pictures of his friends as we went along. At first I did not think it could be done, owing to the vibrating motion inseparable from the progress of the steamer, but we determined to try—I say we, because I had volunteered assistance with any work of the kind.

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* *Photographische Correspondenz.*

The first thing to be done, of course, was to rig up a dark room. This we did by stopping up the dead light in the mate's cabin with a pillow, and using the lamp with a piece of yellow bunting round the globe. The washing bason formed the sink, another water bottle afforded the means of washing the plates, though the amount of water we could afford to spend on each plate was, to say the least of it, small.

My friend the mate must have been to a very queer shop to purchase his chemicals, as they had rigged him out with about a quarter of a pound of cyanide of potassium, and two drachms of nitrate of silver! There were several dozen of glass, but only two ounces of collodion! We fortunately found plenty of nitrate of silver in the doctor's shop, and two or three other chemicals which were wanted. A preliminary plate showed that the camera was quite out of order, being far from light-tight, and defective in other ways. This was near bringing our attempt to a standstill, but we were saved by one of the passengers, who was taking out a lot of apparatus, and we got the loan of a camera from him.

Thus equipped, we set to work the first fine day, and the first plate we tried was a grand success. The view was taken from the stern taffrail, looking along the quarter-deck, taking in part of the mizen and mainmasts, all the foremast, the funnel, rigging, &c. The exposure was comparatively instantaneous, and the picture was sharp and clear in all parts, there being no trace of "movement." Encouraged by this, we tried views in succession from the engine hatchway, the captain's bridge, the forecastle, &c. In most of these we found that the "instantaneous" exposure was much too short, and that as much as three seconds were needed, and, in one or two cases, even more. It became a question here whether the rolling of the ship would interfere with our success; but this proved quite a false alarm. Care was, of course, needed to avoid the heavy rolls, and to take the photograph at the point of least movement—for instance, just the end of one roll and the beginning of the next, or else in a quiet interval between two sets of heavy rolls. Most of our photographs were taken when the ship was rolling from about twelve to fifteen degrees each way. This means tolerably calm weather; but, with a fresh breeze, enough to steady us by means of the sails. I don't think photography would be possible with the ship rolling forty-five degrees each way, as has been the case several times on the voyage, as then it is not so much the camera that wants holding up as the people.

Our success with views of the ship was so complete that we next adventured upon trying groups of the passengers. We at first contented ourselves with only two or three figures in a group, and these very small. Our success here was again complete, and the passengers generally became so interested in the proceeding that group-taking became quite a regular amusement so long as the collodion lasted. We managed to get about thirty plates, carte size, out of the two ounces of collodion.

Taking the experiment of photography on ship board, as a whole, I am confident that it was so successful as to warrant a further trial on a more extended scale; and if I have the good fortune to be able to make another voyage, I shall certainly take a complete kit with me for photographic work on board.

Photographs of some of the waves and some of the skies I saw on the voyage out would be worth anything to an artist; and they could be done well from the ship as she goes along.

In the event of any brother photographer contemplating a voyage, I would suggest a trial of the art at sea, feeling confident that much pleasure, and not a little profit, would accrue from a skilful use of the camera on ship board.—I am, sir, yours truly, **Nelson K. Cherrill.**

A SIMPLE COFFEE PROCESS.

Sir,—Being the "correspondent" referred to in your answer to "J. H. W.," on page 312 of the News, I shall esteem it a favour if you will in some form or other tender to that gentleman my best thanks for the very interesting and valuable information which he has so kindly and courteously given in regard to the coffee process. Having been from home, I have as yet only been able to give the process as laid down a few trials; but from what I have obtained I can clearly see that the capabilities of it are very great. I also beg to thank you for having put my request for information before "J. H. W."—I am, sir, your obliged servant, F. M. Y.

Ryde, September 4th.

Proceedings of Societies.

French Photographic Society.

A meeting of this Society was held on the 8th ult., M. Chardon in the chair.

The **Secretary** announced that the Edinburgh Photographic Society had forwarded particulars of an exhibition to be held in that city on the 15th December next.

It was announced that Dr. Fayer, a professor of medicine at Caen, had forwarded some micro-photographs taken by a lens of his own construction.

M. **Perrot de Chaumeux** reviewed the foreign journals for the past month.

M. **Geymet** submitted some examples of printing by means of fatty ink, including a series of photographs prepared for instructional purposes at the Ecole Centrale. M. Geymet forwarded some portraits also printed by mechanical means, with the remark: "The portraits I send prove that with good cliches, prints may be obtained in greasy ink equal to those produced in the ordinary manner. I would call attention to the circumstance that all of the pictures have been pulled with a tinted border, which has the effect of India proof. This tint, which forms a margin round the print about a centimetre in breadth, is printed at the same time as the picture, the ink being applied with the same roller."

M. **Derogy** exhibited a printing frame for producing pictures with Denier effects, such as are called in America porcelain prints. The effect is produced by printing half-way in the ordinary manner, and then distancing the cliche in a slight degree from the paper. The cliché is not moved more than a millimetre from the paper, but this has the effect of softening the print, and making good defects which would otherwise necessitate retouching.

M. **Liebert** remarked that in America there were several kinds of printing-frames designed to give the same result; the effect was not, however, very popular in France, by reason, probably, of the skill attained in retouching in that country.

M. O. **Schulte** presented the Society with a new description of pocket photometer.

M. **Laurent**, of Madrid, exhibited a series of photographs reproducing art treasures in Milan.

M. **Leon Vidal** presented the Society with an example of his photometer for printing carbon pictures, and blocks for greasy ink impressions.

M. **Koch** submitted a travelling apparatus for working dry and wet plates. It was capable of being collapsed into a flat box without necessitating the removal of the lens.

M. **Liebert** exhibited before the members of the Society an apparatus which he had purchased in England for rapidly heating water. It consisted of an iron cylinder forty-five centimetres high and twenty broad, in the interior of which were spiral tubes of copper, that were in contact with the flame as soon as the heating began. The water was poured into the cylinder, and, penetrating the tubes rapidly, became warm. It was a most economical method of warming water.

M. **Roger** remarked that a patent was taken out in France for such an invention ten years ago.

The proceedings then terminated.

Talk in the Studio.

The British Association for the Advancement of Science opened its meetings in Glasgow on Wednesday last, when Dr. Andrews, President for the year, gave his inaugural address. Any particulars interesting to our readers will appear in our next.

Photographic Exhibition.—The Exhibition of the Photographic Society will open with a Soirée this (Friday) evening at seven o'clock. On the 9th it will be open to members and the public, the latter paying one shilling each admission. On the evenings of Monday and Saturday in each week it will be open to the public on payment of sixpence each. It will close on the 14th of November.

A Night Attack.—We learn from a Brighton paper that Mr. Bertin, photographer, of that town, heroically assisted in defending Miss Jennie Lee, the well-known actress, from a rude attack in the dark by some roughs in the street, her husband and another gentleman being quite outnumbered when Mr. Bertin came up.

The Prince's Courtesy to Photographers.—On Monday last their Royal Highnesses the Prince and Princess of Wales gave a ball to the tenantry of the estate and the company staying at Abergeldie and Balmoral Castles. Amongst those present were H.R.H. Prince Leopold, H.R.H. Princess Beatrice, the Rt. Hon. Sir Stafford Northcote, Rt. Hon. Sir Thos. Biddulph, Rt. Hon. Sir W. Knollys, Col. Ponsonby, Col. Gardner, Capt. Montague, &c. The Messrs. W. and D. Downey, of Newcastle and London, who are at present photographing for Her Majesty and His Royal Highness, had also the honour of being invited.

Proposed Optical Barometer.—When a refracting prism is successively immersed in media of different refractive indices, the ultimate angular deviation of the ray will, as is well known, depend in each case on the relative indices of the glass and the medium surrounding it at the time of experiment. And as a refractive index of atmospheric air varies with its density, the amount of deviation of the refracted ray will be a measure of the density of the air, that is, will give the means of ascertaining the reading of the barometer at the time. If the ray of light were made to pass through a number of refracting and totally reflecting prisms, the deviation would be increased. If with these prisms a microscope were combined, the prisms might be used as a barometer. Or if the ray be received obliquely on a number of pieces of glass, having parallel faces and slightly separated from each other, although there would be no angular deviation, there would be horizontal displacement which would admit of being measured by a micrometer. How far such an application would be of practical value is certainly doubtful, as the effect of changes of temperature on the prism itself might interfere with the very limited range of the instrument.—*Scientific American.*

A Permanent Ink.—Böttger gives the following formula: 30 parts of extract of logwood are dissolved in 250 parts of water, 8 parts of crystallized carbonate of soda, and 30 parts of glycerine of density 1·25 are added; and lastly, 1 part of yellow chromate of potassium, and 8 parts of gum-arabic, reduced to a powder and dissolved in several parts of water. This ink does not attack pens, does not mould, and is very black.—*E. U. Viedt.*

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To Correspondents.

Fine Focus.—In case of divergence between the chemical and visual focus of a lens, the amount of variation will vary for different distances, and will therefore require the use of judgment each time. But as the correction for slight differences of size in portraiture will be inappreciable in its variation, you may make the correction permanently in the dark slide, by making just the difference between the plane of the sensitive plate and that of the ground glass, which corresponds with the difference between the visual and chemical focus.

Experimenter.—The Photographic *Mittheilungen* is published in Berlin, and the Photographic *Correspondenz* in Vienna. There is only one *Mittheilungen*, and only one *Correspondenz*, devoted to photography. We have not the numbers at hand to search out the references required, but as the allusions to the subject have appeared in various numbers, your best plan is to get the monthly numbers for this year through a foreign bookseller.

W. W.—It is very difficult to help you under such circumstances. Your experience is in opposition to general experience. From your description, you appear to attend to all the conditions of success, yet failure is the result. Are you sure that your distilled water is pure? In many cases we have found that distilled water supplied by country chemists is distilled through apparatus which has been used in the manufacture of essential oils; and water so contaminated is conducive to fog. Again, the addition of excess of nitric acid will at times produce fog. Impure samples of nitrate of silver will produce fog. Dirty plates will produce fog. The use of new collodion will cause fog. Diffused light, and a new and insufficiently acidified developer, will cause fog. Unless, however, we knew considerably more of the circumstances of your special case, it would be difficult for us to point out the individual cause in operation. Fix this fact in your mind, however: a solution of pure nitrate of silver in pure water will yield pictures free from fog if the ordinary well understood conditions of successful working are present, and, as a rule, there is impurity, or the presence of some unnecessary or improper body where fog appears.

A Constant Reader.—We have not seen examples of the copies to which you refer, and hence cannot give information as to the method by which they are produced. But there are many processes in photography by which facsimiles of engravings and etchings can be easily produced. Besides the ordinary photographic processes, we have seen very admirable copies of engravings produced by photo-lithography, and also by the different processes of photo-engraving on metal plates, almost all of which are admirably suited to the production of facsimiles of such in line or etching. We regret that we have not time for answering photographic queries privately.

O. A. M.—The actinic intensity of the light has a considerable influence on the general quality of opal pictures, affecting both brilliancy and tone. If the daylight be fine, nothing exceeds it; but a brilliant artificial light will give better effects than dull daylight. 2. Something depends on the quality of the collodion, both in regard to the pyroxyline and the salts added, as to how soon it is ripe; but, as a rule, we should prefer it at least a month old for such work.

J. H. W.—Thanks. The picture sent is excellent as an example of portraiture, and quite indistinguishable, indeed, from wet plate work.

R. M. G.—The keeping qualities and maturing of collodion depend on several conditions. If the pyroxyline have been made at a low temperature and very perfectly washed, and the iodide and bromide of cadmium be used to salt the collodion, it will keep in a cool place for years. Within the first six months it may probably be scarcely ripe enough to use, and will be better after keeping two years. If the temperature was high at which the pyroxyline was made, and the iodide and bromide of ammonium or potassium be used in salting it, it may be used within a week of its preparation, and at six months it will be very ripe indeed. Any combination or mixture of these conditions will yield a correspondingly modified result. 2. The horny repellent condition to which you refer is generally due to the use of a pyroxyline made at a low temperature, and a preponderance of cadmium salts in the collodion. The best remedy, after age, is the addition of a little very ripe collodion. The addition of a drop or two of water to each ounce of collodion is often beneficial. The addition of a trace of an alkali has been tried, and sometimes with advantage, but there is great risk of inducing fog.

L. V.—The Exhibition will open to the public next Saturday, September 9th, and remain open until the 14th of November. Admission to non-members will be one shilling during the day, and sixpence in the evenings when the Exhibition is open, which will be Mondays and Saturdays. Members are admitted free, and they also receive tickets permitting their friends to be admitted free.

T. Don writes to protest against photographers making capital out of notorious cases. He says:—"For a photographer—one who is supposed to make for himself a name and reputation simply upon the beauty and artistic excellence of his work—to clutch at the miserable opportunity offered by the tragedy and indecent exposure of the Bravo Case, to give his business publicity and notoriety!—bah! photographers should have finer feelings. The other phase of the question is exhibiting or selling portraits of one's client without their full consent. Mr. Fall, speaking of the Bravo portraits, asks if a photographer can legally publish, in such an unscrupulous manner, photographs of his sitters? Need we discuss the legal bearing of the case with *respectable* photographers? What is morally right should influence them as much as what is legally wrong. And their standard of integrity should prevent them from swerving from the right."

F. M.—The general testimony is in favour of the use of nitrate of baryta in the negative bath, as giving immunity from pinholes. Its use for this purpose was first proposed by Dr. Vogel, the assumed cause of the pinholes being the presence of sulphate of silver in the bath, which the baryta was intended to precipitate.

J. J.—The print is over-toned, but is not otherwise bad.

Several Correspondents in our next.

The Photographic News, September 15, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Great Photographic Triumvirate—Blood Albumen and Egg Albumen.

The Great Photographic Triumvirate.—It seems impossible to suggest any new material as a vehicle for the photographic image. Whatever be the novelty proposed or improvement suggested in this process, or in that, we come back always to the same familiar materials. That great triumvirate—collodion, albumen, gelatine—reigns supreme, and have as much to do with photography, apparently, as Niepce, Daguerre, Fox Talbot. At rare intervals, it is true, some new path is struck out, and we hear of silk dissolved in chloride of zinc, glucose, resin, &c., being employed for admixture with the sensitive salts; but these have had little influence upon photography, which still swings round upon the same pivot. In the same way as our railway systems could not have been fully developed without the aid of the electric telegraph, and for this reason could never have attained perfection till half a century ago, even if locomotives and permanent ways had been known for centuries, so photography could not possibly have reached its present state of perfection before 1846, the date of Schœnbein's early researches upon guncotton. As it has turned out, therefore, it would have been little use inventing railways and photography before the beginning of the present century, for the simple reason that neither could have been perfected in the absence of other inventions which have made their appearance since. Now that carbon printing is daily becoming more and more general, gelatine is beginning to oust albumen from its place in the public favour, and we are beginning to find that whatever may have been the defects of the latter, gelatine is by no means free from reproach. This last named body is no doubt a most convenient vehicle to employ in many ways, but it has a temper of its own, like most of us. Do what you will, it always goes on absorbing moisture in some degree, and it never can be depended upon as a hard non-swelling mass. Again, chemists do not yet know all that might be found out about its properties and behaviour under certain circumstances, and there are many phenomena observable of which we can furnish no satisfactory explanation. As an instance, much has been written upon that most serious defect in carbon printing, the articulation of the image, which renders the print very much like a bit of mosaic work; this disagreeable appearance may doubtless be prevented in many instances by following certain precautions, but sometimes the phenomenon obstinately refuses to yield to any treatment at all, and it is more than probable that the defect is due to some particular shortcomings on the part of the gelatine rather than anything else. So that, like albumen, gelatine is by no means irreproachable, and it is likely to give photographers as much cause for sorrow and suffering as the other two members of our small family. And this brings us to mention once again a material to which we have already incidentally referred two or three years ago, and which might, perhaps, furnish a substitute for gelatine, for the latter, by reason of its animal origin, cannot always be had of the same purity. A body, which is sometimes called Thao, and sometimes Ayar-Ayar, and which is doubtless very similar to the material known with us by the name of Iceland Moss, would, we should think, repay investigation. At any rate a series of simple trials would not be thrown away, and they might, perhaps, yield valuable information to photographers. Being of vegetable origin, it would not be open to so many drawbacks to which animal matter is liable, while its price, we are told, is very small indeed. It is employed with considerable success at the Rouen mills, in place of starch, for dressing cloth, its great qualification for the purpose being that it dissolves only at a very high temperature. Ayar-Ayar is found upon the rocky islands around the Malay peninsula; it is of the nature of seaweed, and is collected by the natives for sale to the Chinese and Japanese, who prepare from it, by boiling, a tough and sticky mass, which is not only employed in cloth, silk, and paper factories, but is also used for purposes of consumption. The Chinese regard it as a good food stuff, and large quantities are eaten in that country. It renders paper very transparent, and is employed largely in the manufacture of Chinese lanterns. The material was shown at the London Exhibition of 1862, it may be remembered, and it was then stated that the annual export of the seaweed from Singapore amounted to as much as 2,640,000 pounds. It is known very generally as vegetable isinglass, and has under this name received many applications in Europe, both in factories, and by pastry cooks. Its chemical properties do not seem to have been very widely studied, but it is said not to be precipitated on admixture with permanganate of potash. As it is only soluble at a high temperature, its employment might be welcome, supposing, of course, it is suitable in other respects, in the preparation of pigment tissue used for the Lichtdruck process, in warm climates especially. However, the triumvirate—collodion, gelatine, albumen—has remained so long undisturbed that a material must have very good qualities indeed to recommend it, and in order to take a place beside such old-established favourites.

Egg Albumen and Blood Albumen.—A German chemist, M. G. Witz, has been making an interesting investigation into the demand and supply of albumen, and into the question also of producing this valuable body from the blood of slaughtered animals. Besides the vast amount of eggs annually consumed as food stuff, there is, as our readers know, a great demand for albumen for industrial purposes—in the preparation of leather and for photography. In the latter case, it is the white of egg that is generally employed, in the former it is the yolk. Again, in the calico printing industry albumen is employed to a very great extent, and it is said that in Alsace alone, where a large number of these cotton factories are to be found, albumen representing 37,500,000 eggs, the produce of 250,000 hens, is annually employed. Of course, the more blood albumen that can be employed in these channels, the less demand there will be for egg albumen, and the cheaper it is likely to become. M. Witz tells us that the Alsatian manufacturers have offered a considerable sum for the discovery of a good and cheap substitute for egg albumen; but they have not yet got what they want, and hence they still consume very large quantities of eggs which might otherwise be consumed as food, or for photographic printing. Casein and gum, we are told, have been tried in calico printing, but they yield colours of little solidity, while Teuch's proposal to replace egg albumen with fish sperm has fallen through on account of the impurities it contains. It seems, however, that blood albumen has been approved of by manufacturers as a partial substitute, but it cannot be employed by reason of its dark tint in the printing of delicate colours. Blood does not, after all, furnish very much albumen, for the amount from an ox or cow is but four hundred grammes of the dry material. It is calculated that if Paris chose to keep all the blood that is shed annually at the slaughter houses, albumen could be prepared from it equal to seventy-two millions of eggs. One kilogramme of albumen represents 2½ oxen, 10 sheep, or 17 calves, or, again, 366 eggs. We doubt whether the blood albumen could be made suitable for photographic purposes in the preparation of albumenized paper, owing to its colour; but it might be employed for mixing with bichromate of potash in many of the photo-mechanical printing processes. The manufacture of dry albumen—which is more extensively carried on than ever at Passau on the Danube—has had the effect of considerably cheapening the supply of this valuable material, for large quantities of eggs produced in mid Europe are now made available for manufacture and food, for which, otherwise, there would be no market. This dried albumen is said to be in all respects equal to freshly broken eggs for most purposes, and, in the opinion of several German photographers, it may be employed with as good results in our art as the first material. The dried albumen powder is prepared both as egg-white and egg-yolk.

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FRENCH CORRESPONDENCE.

M. le Comte de Courten on Photography and Art—The Influence of Photography upon Painting—Style in Photography—White Skies in Photographic Landscapes—Composing a Landscape.

M. le Comte de Courten has just sent me a series of interesting observations upon some processes relating to topography. No one is more capable of dealing with the subject of which he treats; his art qualifications are of the highest, for his studies in that direction have been profound; his manipulative skill as an operator is of the first order, and his general knowledge stands him in good stead in grasping applications of photography in all directions My friend on the present occasion warmly discusses the arbitrary law which tends to put photography outside the pale of art. The period which has elapsed since the discovery of photography has been utilized in the elaboration and perfection of processes, the end aimed at being to obtain clichés more and more perfect. Thus, says M. Courten, the greatest difficulties in manipulation once surmounted, one has at his disposal time and leisure, so that every effort may be directed towards art improvement. Having the means to do good work, good taste and the faculty to produce choice pictures may come into play.

Since the introduction of collodion by Archer, this truly fundamental part of the process has undergone no change; in fact, while the formulæ have varied very much, the method itself has not been materially modified. The products employed have been changed, and an organic acid has been substituted for an iron salt; the proportion of this or that substance has been altered, but in the main the process is pretty well the same as ever. Thus step by step we have become enabled to manage the light as we desire, until we have very nearly attained to perfection in the art. Gradually we have been able to devote ourselves more to the art side of the subject, and one must be blind not to have seen the progress that has been made in this sense also.

M. de Courten protests energetically against those people—and there is a large number of them—who fail to see anything but a mechanical process in photography, and judge of it by the vast number of productions which are, unfortunately, produced, and which possess, it must be admitted, not the least claim to be considered works of art. As our eminent amateur remarks very truly, there are two very definite things in photography: the process, which belongs to science, and the application, which is in the domain of art. The two must march together. If you are in possession of a process, no matter how excellent, the best chemicals will not avail you if you lack intelligence and good taste, and your results will only prove your incompetency. On the contrary, if you possess good taste and intelligence, but have a bad process, or if you neglect the necessary care, or lack the necessary knowledge, then you will fail most woefully. Now-a-days, no matter how perfect the process, or how subtle may be the operator, it is necessary to pass through a long apprenticeship before you can be altogether successful. You must study the infinite resources of the light rays, so as to render yourself master of the manipulations; you must know the value of the optical angles with which you work, and the variations brought about by the use of different diaphragms. In fact, a thousand things have to be learnt and taken into account before you succeed in obtaining perfect pictures.

Of late, says M. de Courten, art has a tendency to approach to realism, both in regard to form and colour, and it is certain that photography has had something to do in this very marked change that has come about. Photography is very realistic, but nature may be interpreted in many ways, and it may be affirmed that every photographer has his manner of transcribing nature in the same way as every painter has. This observation is so true that a practised eye is capable of telling the author of a photograph without looking at the signature at the bottom. For myself, continues M. de Courten, I have had so much experience that in visiting an exhibition, before it is complete I am able, without catalogue or other information, to recognize the works of the greater part of the exhibitors.

M. de Courten naturally attaches great importance to retouching in the case of portraits, and he regrets that it is so frequently confined to the unskilful. In regard to landscape photography, our friend cries out indignantly against white skies and paper skies, which destroy all harmony and suppress the sun altogether. According to him it is simply absurd to depict a landscape under these circumstances: never does the sky appear more luminous in nature than objects directly illuminated; the more luminous power that the sun exerts, the more intensely white is the sky. In the morning, before the sun rises, the sky appears clearer than the terrestrial objects, and it is the same after the sun has set, but then there are no shadows; to have shadows in a picture which, at the same time, ignores the sun, is nonsensical. Where you have white paper to represent the sky, the most highly illuminated object appears grey and loses its importance. When in his clichés M. de Courten obtains an opaque sky (which, he says, is very rarely) he destroys it at once, no matter how perfect it may otherwise be. To prevent these opaque skies he has recourse to a method elaborated after much study, which he has published. In landscape photography he exclusively employs a dry process of a rapid character, and being perfectly master of the technical part of the process he can give all his attention to the choice of subject, lighting, &c. A landscape, he says, should be treated in the same way as a portrait, arranged and posed with the same care. One can hardly transplant trees or transport mountains; at the same time the difficulties to be overcome are immense, and true artistic sentiment is necessary on the part of the photographer to search out the beautiful from that before him, and depict the scene from the most favourable and picturesque point of view. A landscape has rarely more than one point of view from which it composes thoroughly well. The height of the horizon, the line of the ground, the delineation of the picture, the effects of lighting, all necessitate judgment, which can only be well exercised by those who have studied the art. But, adds M. de Courten, if anyone examining one of your photographs exclaims, "What! is this a picture of that wretched little path that I traverse every day of my life, this pretty sketch that I hold in my hand?" you may be quite sure that you have produced a work of art by investing with poetry that which before was not known to possess any.

So true have M. de Courten's observations appeared to me that I have not hesitated to reproduce them here.

Ernest Lacan.

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ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION.

[From our own Correspondent.]

The forty-fourth exhibition of the Royal Cornwall Polytechnic Society at Falmouth was, as noticed last week, a very instructive one as regards the photographic section. The chief merit in portraiture may be claimed by Brown and Barnes, of Liverpool, and George Nesbitt, of Bournemouth; and the judges marked their appreciation by awarding the first named firm two medals, a special silver for a paper negative (landscape 17 by 22½) printed in a pressure frame from a transparency enlarged from an untouched 10 by 8 glass negative, the print from this paper negative being shown with it, which would fully bear comparison in sharpness and delicacy of detail with those of the same size taken direct. The second medal, a first bronze, was for some very fine enlargements, vignetted head and bust, on opal glass. Some very fine vignetted portraits were also exhibited by the same firm, which were of a peculiarly delicate, at the same time forcible, character, produced by their new mezzotint process. Mr. Nesbitt may justly be styled an artist photographer—a term too often misused. His collection has never been excelled in this exhibition. They are pictures as well as portraits, and the story of each is at once apparent. They are also fine studies of lighting. A first silver medal is awarded the collection.

Messrs. George Cooper and Co., of Hull, obtain a first silver medal for some direct portraits from life, three-quarter length, on whole sheet of paper. They are doubtless good photographs, but lack the richness of those exhibited some two or three years since by the same firm. A very large composition, six feet by five feet, is an exceedingly ambitious affair, the subject—"The Meet of the Holderness Hunt;" the figures—human, equine, and canine—being from negatives taken in the field, and the landscape painted in monochrome by hand. It shows a vast amount of labour; but the reduced photograph will not bear comparison with the engravings of kindred subjects.

Mr. A. Ford Smith is fortunate in obtaining a second silver medal for his "Olden Time," the manipulation of which is good. Messrs. Chaffin and Son's group is a fine photograph. Mr. B. Wyles' name is attached to ten very fine pictures, "The Fairy Glen" and "The Llwgwy" being particularly rich and effective; a second silver medal is the attachment. Mr. W. D. Sanderson is deservedly awarded a first silver for a 17 by 22 landscape, "A Trout Stream," *dry process;* while the second silver attached to Messrs. A. and J. Bool's "On the River Wandle" might, with propriety, have been a first, of which it is certainly worthy. But are not these two last awards in direct contravention of the Society's rule: '*No holder of a medal or prize may receive a prize of the same or a lower value for similar subjects in the same department at the* NEXT TWO *subsequent exhibitions*"? A reference to the catalogue and report for 1874 will show that awards of the same value were made in that year to the two last named exhibitors. Mr. W. Widgers' Devonshire scenes, particularly his "Cockington, Torquay," were very striking to the eye, and obtained a first bronze. Messrs. E. P. Lee and Co., Cardiff, again showed their ceramic photo-enamels, and have obtained a second silver medal; there not being any other in competition with them, no comparison can be given; the colouring of these is very delicate and effective.

Some exhibitors must always be left out in the cold away from substantial awards, and the unfortunates this year, whose ill success must be attributed not to want of merit, but simply that the bag was exhausted, are Warwick Brooks' four academy pictures, emblematical of literature, art, masonry, and the drama; Mr. H. G. Cocking's four portraits, including "What will Missus say?" a servant maid holding in her hand a broken jug which she has just had a misfortune with. The high light a little more brilliant, with a corresponding increase in the depth of shadow, would be an improvement in these exhibits. Mr. J. H. Hogg's frame of four portraits is in the same category, one of which should be particularly noticed, a three-quarter length sitting. Messrs. Barry and Co. had on exhibition a series of eight separate portraits, and a large frame of cabinet size of more than average excellence. Mr. Milman Brown's "Falling Leaves," "A Study in Shanklin Chine," "The Wishing Gate," and "A Giant Ash," attracted some considerable attention, as did some Scotch scenes by Rueben Mitchell. The Excelsior Photographic Co., Seaton, were exhibitors of some very good portraiture.

A large, valuable, and instructive collection was lent by the South Kensington authorities, consisting of views of Old London, and reproduced copies of miniatures of celebrated personages, exhibited some years since. Lady Graves Sawle contributed for exhibition a portfolio of very interesting Egyptian photographs by Paul Sebah and others, and Mr. R. Griffith's two frames of eight pictures of Navajo Indian War Chiefs. In the amateur department Mr. R. Crawshay is, again, a strong exhibitor, showing pictures equal to any in the professional department; Mr. W. J. A. Grant obtains a first silver for some very beautiful studies of trees; Mr. H. W. White a second silver for a large collection of photo-ceramics, numerically and in variety of subject and tone, an exhibition of themselves, and made so by having a separate room; Mr. R. O. Milne, a first bronze for some very good landscapes; and Mr. H. A. H. Daniel a second bronze for ditto; while Mr. H. Manfield's delicate little views near Lynmouth failed to obtain any notice, though they certainly deserve commendation.

Mr. J. H. Dallmeyer exhibited a variety of his fine lenses, &c., and Mr. George Hare his automatic changing-box for dry plates, a most useful little invention, which seems to have escaped being noticed, from the circumstance that it was placed in the mechanical department, the judges of which were perfectly at sea as to its use, whereas it should have been booked by the photographers, who would have readily understood it.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

Photography—Judges' Report.

BY THOMAS HART.

The judges in this department have great pleasure in bearing testimony to the splendid collection of photographs exhibited this year; they consider them the finest ever brought together in the West of England. A first silver medal for the best portrait is awarded to Messrs. George Cooper and Co., of Hull, for No. 687, a portrait of an old gentleman—an exceedingly fine photograph (being one of four which they exhibit taken direct from life); they send also a large *photo-picture*, "The Holderness Hunt," from several negatives taken in the field.

A first silver medal for the *best group* is awarded to Mr. Nesbitt, of Bournemouth—No. 696, "The Finishing Touch;" this is an extremely artistic production, well grouped, and a splendid photograph. A maid is giving the finishing touch to the toilet of her mistress, who is dressed for a ball The delicate shades in the dresses are beautifully rendered. Mr. Nesbitt exhibits nine others, evidencing the same artistic feeling. No. 688, "Evening Prayer," is full of poetry. No. 692, "Morning," and No. 693, "On Guard," are both well conceived and executed.

A first silver medal is awarded to W. D. Saunderson, of Manchester, for his fine photograph of "A Trout Stream," by a dry process.—No. 767. This picture is quite equal to any we have ever seen taken by the wet process; it is full of the most delicate detail.

A second silver medal is awarded to Messrs. A. and J. Bool, London, for their fine photograph, "On the River Wandle." It is taken from a well-selected spot, has a fine sharp foreground, and an exquisite middle distance, full of atmosphere. They exhibit others showing the same skill; also a case of photographs of "Old London," which are valuable in more than a photographic sense.

Mr. B. Wyles, of Southport, sends a series including portraits, landscapes, and a church interior. A second silver medal is awarded to his No. 738, "Whence Hangs a Tale." They all show that Mr. Wyles loves his art, and is a thorough artist in feeling. His No. 743, "Grapes Not Sour," is an excellent picture. A well-to-do and happy young lady is looking out and smiling, near trellis work with vines trained over it. His No. 736, "The Llwgwy," is a fine photograph, with very successful sky and a well rendered distance. No. 737, "The Conservatory," is full of the most delicate detail.

Mr. A. F. Smith, Llandudno, sends a series. No. 734 has a second silver medal awarded to it. The interior is exceedingly good; and his "Olden Time," No. 733, a group, is very cleverly executed. So is his No. 732, "Spring," another group, showing he is an artist working in the right direction, and not a mere mechanical photographer.

Messrs. Brown and Barnes, of Liverpool, exhibit a case of portraits by their patent mezzotint process, which are exceedingly artistic. The apparently rough paper background enhances very much the fine quality of the delicate shades of the faces. A special second silver medal is awarded to their large transparencies, No. 710, "The Brook," and No. 711, waxed paper negative; and a first bronze medal to their *enlarged* portrait, No. 708. Others exhibited by them bear the stamp of high class work.

Mr. Widger, of Torquay, has a first bronze medal awarded to his No. 762, "Cockington, Torquay." No. 759, "Holy Street Mill, Chagford," is an excellent rendering of the mill, from a well-selected spot. His No. 760, "Exeter Cathedral," is very good indeed.

Messrs. E. P. Lee and Co., Cardiff, have a special second silver medal for their excellent case of ceramic photo-enamels.

Mr. Warwick Brookes, of Manchester, sends four very fine portraits, with characteristic ornamental borders, representing literature, drama, art, masonry.

Messrs. Chaffin and Sons, of Yeovil, send two very fine, large portraits, beautifully modelled and well lighted; also a very fine *group*; and "The Excelsior Company," of Seaton, exhibit four artistic and well executed portraits.

Others exhibiting first-class work are:—

A. G. Tod, of Cheltenham (his No. 677, "Drawing Room, Hatherley Lawn, Cheltenham," is a splendid example), Frederick Palmer, of London; H. Hogg, Westmoreland; E. Bligh, Fowey; J. Millman Browne (his No. 718, "The Wishing Gate," and No. 716, "Falling Leaves," a study, are good examples, showing patient and loving study), and R. Griffiths, Truro. G. Cocking, of London, sends fine examples of his highly artistic work; Nos. 730 and 731 are particularly good. Messrs. Barry and Co., Hull, exhibit a large case of portraits, showing delicate manipulation with good lighting and posing; George F. Dew sends some of the best landscapes in the Exhibition (his No. 783, "On the Avon," and No. 782, "A Pleasant Nook," are particularly good).

The amateur department is well represented by Mr. Crawshay, who sends twelve examples of his painstaking and exceedingly artistic studies, showing that he has an eye for the beautiful in nature everywhere, as evidenced by the variety of his works. Mr. W. J. A. Grant has a first silver medal awarded to his "Tree Studies," No. 823, which rank amongst the best in the exhibition. Mr. R. O. Milne has a first bronze medal awarded to his No. 829, "In Kincorth." Mr. H. Manfield exhibits some good views near Lynmouth. Mr. H. A. H. Daniel has a second bronze medal for his No. 822, "The Old Bridge;" he exhibits five others, which are very clever productions. Mr. Henry W. White sends a splendid collection of photo-ceramics, showing that he is not easily daunted by difficulties, which are many; he has succeeded in getting more than a dozen colours—or tints, rather—and we wish him every success in future. A second silver medal is awarded them.

ON A METHOD OF PHOTOGRAPHING THE DEFECTS IN OPTICAL GLASS ARISING FROM WANT OF HOMOGENIETY.

BY HOWARD GRUBB.*

The best practical method used for detecting, in discs of optical glass, defects arising from want of homogeniety, is possibly well known to many amateurs, as well as professional opticians. The disc of glass to be examined should be either itself polished to a convex form, or, if that be not convenient, it should be placed in juxtaposition with a piece of glass which is known to be perfect, and of such a form as will render the combination of the two of convex power. A small light (say a candle or gas flame) is placed at some little distance, and the eye is placed in the conjugate focus, formed by the lens, of the light. The disc of glass should then appear brilliantly illuminated, but if the pupil of the eye is drawn slightly to one side, so that the pencil of light falls upon only one-half of the pupil, immediately and most distinctly almost any want of homogeniety is easily seen. I say *almost* any want of homogeniety, because I believe with one exception any kind can be detected, but I have met, very rarely, instances of one peculiar class of this defect, which it is not possible to detect till the disc is actually worked into an objective; this happens when a slight gradual change of density occurs between the two portions of the disc with no abrupt line of separation between.

Now this process, though a very simple one to a practised eye, is by no means so to an uneducated one, and I have often desired a method by which I could graphically represent those faults, so that I might be able to communicate to others my ideas as to their exact forms and appearance, position in the disc, and so forth, and also to form a record of them.

This, by a very simple contrivance, I have succeeded in doing, and I am now able to photograph these defects in optical glass with perfect certainty.

The eye of the observer is replaced by a photographic camera, and with a little care in adjusting the image of the flame on the diaphragm of the photographic lens, very excellent photographs can be obtained. In fact, the stop of the lens replaces the pupil of the eye, the photographic lens the crystalline lens, and the sensitized plate the retina.

The defects arising from want of homogeniety in optical glass may be divided into three classes:—

First.—Threads or fine seams of some different quality of glass passing through the otherwise homogeneous disc, sometimes insignificant, sometimes long, but very rarely of any width; these are of little importance.

Second.—Veins or syrupy bands. These are portions of glass of differing and various densities, not properly amalgamated together. Their appearance is that produced by adding a strong syrup solution to water. The forms of these veins are sometimes very fantastic. This form of defect is sometimes very detrimental.

Third.—Sometimes, but very rarely (only four times in my experience) have I met with discs of glass having a density slightly different in different parts, without any well-defined line of demarcation between the different parts. This is most destructive to its performance as an objective, and a most dangerous fault, for whereas in the two former cases the defects can be easily detected, the third defect defies detection until the disc has been formed into an objective.

It is fortunate for opticians that this defect is of such rare occurrence.

PHOTOGRAPHY IN CONNECTION WITH THE OBSERVATION OF THE TRANSIT OF VENUS AT ROORKEE.

BY CAPT. J. WATERHOUSE, ASSISTANT SURVEYOR-GENERAL OF INDIA.*

Another defect of the photo-heliograph was that the hanging counterpoise, placed near the object-glass of the telescope when using the Janssen slide, was found to swing and induce a tremor in the instrument, spoiling the definition of the pictures; it was therefore replaced with a rough but efficient substitute in the shape of a canvas bag, the ends of which were filled with shot. This was merely hung over the end of the telescope at the proper balancing point, and kept the tube perfectly steady.

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* Read in Section A, British Association.

* Concluded from page 424.

As regards the process to be adopted for photographing the Transit of 1882, much will depend on the results obtained by the different methods used in December last as to whether photography can be advantageously employed, and, if so, which process is most suitable.

As far as my experience goes, the wet process seems less favourable to perfect sharpness and clearness of the image than the dry; but Colonel Tennant tells me he has lately obtained very superior results by using a pyrogallic acid developer with bromo-iodized collodion in place of the iron development. From experience I have gained in preparing for photographing the recent Eclipse, I believe that great advantages may be obtained by slightly staining the ordinary wet films with orange or red aniline dyes, or by the use of moist plates, prepared with bromized or bromo-iodized collodion, afterwards treated with albumen and glycerine, which I have found very simple to prepare, and exceedingly free from all tendency to blurring or irradiation. It is probable, however, that before 1882 the usual modes now in vogue for taking negatives will have been quite superseded by the simpler method of using sensitive emulsions, which have only to be poured on to the plates and dried without any future preparation. Great advances have recently been made by Carey Lea, Bolton, and others in obtaining such emulsions capable of giving pictures with the same rapidity as the ordinary wet or dry processes, and with a perfect freedom from the irradiation or blurring so detrimental in astronomical photography; besides which the perfect simplicity and ease of the operations are a strong recommendation; and I may, I think, safely predict that should photography be used for the next Transit, the emulsion processes will, if not exclusively, be used very extensively; unless, possibly, the superiority of pictures taken on Daguerreotype plates or silvered glass films over those on collodion should be incontestably proved, or some other better process be discovered meanwhile.

Although the photographic operations connected with the observation of a transit of Venus present no great difficulties, and are in some respects easier than photographing the total phase of an Eclipse, a great deal of patient careful work is required beforehand to ascertain the best conditions for working with regard to local circumstances, and this the short time at my disposal on the present occasion scarcely allowed me to have, especially as so much time was spent over the dry process which might, as the event proved, have been well employed in perfecting the wet. It is therefore very desirable that the subject should not be lost sight of between this and the next Transit, and that every opportunity should be taken of utilizing the experience already gained towards ascertaining the most perfect methods of taking these sun-pictures. It would also be advisable that as many as possible of the observers of the last Transit should also take part in the next.

Although the Transit of 1882 will not be visible in any part of India, much useful preparatory photographic work might be done concurrently with the daily observations of sun spots, now that an instrument is available for taking advantage of the comparatively fine weather enjoyed in this country, particularly at the time of year when the weather in Europe is most unfavourable to such observations; and this would not be the least among the many advantages to science to be gained by the establishment of a Solar Observatory in this country, which has been so earnestly advocated by Colonel Tennant, and, it is to be hoped, will soon be an accomplished fact.

THE CARBON PROCESS IN PRACTICE.

BY DR. JULIUS SCHNAUSS.*

During the hot days of the present summer I had an opportunity of observing the varying qualities of the pigmented paper in commerce, which is no doubt to a large extent of English manufacture. I am afraid that many besides myself have had similar opportunities, and have been worried over the circumstance that they have not been able to depend upon supplies being of the same character. The complaint that in development of images upon glass, especially, there appears over the surface a delicate net-work of insoluble black, which renders the production of perfect pictures impossible, is, as I have reason to know, a very general one indeed. This defect is seen at its worst in the case of papers which have been prepared some time, for some freshly prepared material made by myself appeared quite free from any such fault. Just before the commencement of the hot weather there was scarcely a trace of the defect to be found in this paper, and yet it shortly afterwards became unserviceable.

The defect is truly one of the gravest difficulties in the way of carbon printing, for it seems scarcely capable of being got rid of, at any rate, in summer. The circumstance of the gelatine becoming too highly dried by the hot weather appears to be the main cause. It is impossible almost to set aside the defect when once the mischief is done, but much may be done to improve matters if the paper, the night before it is sensitized on the chromate bath, is put into a cellar where it may absorb moisture. Care must be taken, of course, to prevent it touching anything, and its surface must be sheltered from dust. It should be permitted to float but a short time upon the bichromate bath, and should be pressed with the squeegee, and rapidly dried. Finally, it must be printed and developed as soon as possible.

Old sensitized pigment paper becomes perfectly horny, and repels the water when put to soak. A picture in relief may be seen with perfect distinctness. Such an image is of no good whatever, and refuses to adhere to any surface at all. The employment of a very cold bichromate bath does not in any way prevent this network formation over the surface of the tissue. But it is desirable, after pressing the tissue, to allow it to remain upon its support for some time; indeed, it may remain for hours without injury. A preliminary moistening of the tissue for too long a period in cold water is not to be recommended; neither is it well to develop in water of too high a temperature.

Another peculiar phenomenon, in the case of diapositives, is the adhesion of tiny paper fibres of the pigment paper to the glass. This often happens even when you are developing two images upon one plate which have been prepared from the same paper, and under the same circumstances; one of the pictures will appear quite clean in the warm water, while the other is covered with paper fibres. In the one case, however, the paper backing has come off very rapidly by itself, while in the other, when the fibres are to be seen, the paper has been more adherent. The proper explanation of this, which is very different to what has yet appeared in print, I have not been able to discover.

Many of the samples of pigment tissue which Dr. Liesegang has recently received for the preparation of diapositives and paper pictures I found to be quite free from the two defects I have mentioned, the network formation and the paper fibres. According to my view, there ought to be a modification adopted in the preparation of the pigmented tissue during the summer months, so that the gelatine, which is so sensitive to temperature and to moisture, may be made to undergo an alteration in its properties. As matters at present stand, it is obviously better for consumers to draw their supplies in small quantities rather than keep a large stock of the material at their studios.

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* *Photographische Correspondenz.*

The Photographic News.

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THE PHOTOGRAPHIC EXHIBITION.

The annual exhibition of photographs held under the auspices of the Photographic Society was opened to the public on the 9th instant, the private view by members and their friends having been taken at a *soiree* held the evening previous. The plan, which we cannot but regret as being as impolitic as it is novel, of requesting visitors to wear evening dress, tried last year for the first time, was repeated this year, and to that, probably, the scanty attendance was due, a few more than a hundred being the total attendance, and of these scarcely more than half wore the regulation evening costume they had been requested to assume.

The exhibition is not, in point of numbers, equal to some of the exhibitions which have been held in former years, but it contains many very fine examples of photography. There are not many ambitious pictorial attempts; but there is a level excellence fairly typical of the average high standard to which every-day photography has attained. The absence of many exhibitors whose work at one time always lent a tone to the exhibition is, of course, felt. Robinson, O. G. Rejlander, Henry Cooper, England, Mayland, Marshall Wane, Abel Lewis, Frank Good, and many others, are conspicuous by their absence. There is also a great lack of novelty. Carbon printing is admirably represented both in excellence and quantity, and there are some fine examples of photo-mechanical printing, those by the Woodbury process being especially excellent; but we saw no examples of photo-engraving or photo-block printing, and no photo-ceramic work.

Some of the landscape work is very admirable. The charming views of Mr. Wm. Bedford, printed in a rich engraving-black tone, are technically, and generally artistically, little short of perfection. Mr. Crawshay's fine and varied collection of landscapes, full of pictorial and photographic excellence, are amongst the choicest views of the exhibition. An exhibitor, whose name has not appeared, we think, in former catalogues, Mr. F. T. Palmer, sends some pictures which will attract admiration as well as attention. Mr. S. G. Payne sends a number of unusual and interesting contributions, amongst which are many examples of portraiture with ornamental entourage, similar to those with which we were favoured some time ago, noticed at the time in our pages. Mrs. S. G. Payne sends a fine collection of her floral photography; the artistic grouping and the excellent photography are alike satisfactory. On the whole, they exceed any floral photography we have previously seen. Captain Abney and his Royal Engineer class send many magnificent landscapes. A. and J. Bool send examples of large landscapes possessing the peculiar atmospheric charm which always distinguishes their work. Col. Wortley's large cloud subjects are admirably chosen, and well rendered. A. Ford Smith's "Water Lilies" make a singularly fine picture. W. D. Sanderson sends some large landscapes from collodio-albumen plates, which are in every way excellent.

In portraiture there is a very high level of excellence. Mr. Faulkner sends another instalment of his very extensive infant gallery, all winsome, all full of natural grace; and some examples of the powder carbon process on opal glass, which are really highly finshed works of art, so thoroughly does the process lend itself to artistic manipulations. Mr. Slingsly sends a number of fine portraits, but no subject-pictures. Unsurpassed in portraiture, pictorially treated, are the contributions of Mr. G. Nesbitt, of Bournemouth. A number of examples from the studio of the late Mons. Boucher, of Brighton, are unusually rich and grand in treatment throughout. Some large portrait groups forming *genre* pictures, by J. Chaffin and Sons, have many fine qualities. The photography is very fine indeed, but the artistic aim of the picture is not quite perfectly carried out in every case. A little *genre* study, by Adam Distin, whom we are glad to welcome again as an exhibitor, entitled "Evening Prayer," is very fine indeed.

We can only give a general sketch of some of the pictures which have most attracted our attention, as up to the last moment before the soiree some few pictures for which space had been spoken had not arrived. In our next we shall probably give some more detailed criticism. Before closing this brief preliminary notice, however, we would call attention to an interesting illustration of the permanancy of some silver prints under trying circumstances. Some enlargements from small negatives contributed by Mr. J. H. C. Harrison (of Asnieres, Paris), are capital illustrations of the durability of developed prints. These pictures (115 and 257) were enlarged, one from a card and the other from a stereo negative on Talbotype paper, and developed in the ordinary way. It will be seen that they are of a rich black tone on plain paper. In relation to them Mr. Harrison says:—"The question of permanency being on the *tapis*, this proof (257) is shown in evidence of some stability in certain salts of silver under very trying circumstances. It was exposed during the summer heat, in the Palais de l'Industrie Exhibition of 1870, and medalled. It had to be removed in consequence of the Franco-German war, and during the Siege of Paris was housed in a damp place; the frame was well covered with cloth, which was eaten away by the rats. Many other prints, negatives, and property to the amount of £1,600, were entirely destroyed by the Mobiles soldiers. The self-same picture was also exposed at the Exposition of Vienna, 1873 (Medaille de Progress), and likewise there experienced the usual trying variations of great heat by day and dampness at night inseparable from all universal exhibitions, and now, after seven years, I do not see the least change; if anything, the whites are whiter than they originally were, the tone, though not rich, being exactly the same. No. 115 contains an enlargement from a carte-de-visite cliché, 'Foret de Fontainebleau, chiens de chasse au Sanglier, appartenant á M. le Vte. O. Aguado.' This proof, by the same process, has experienced the same crucial circumstances as it." No trace of fading is perceptible on either print.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The annual meeting of the British Association was this year held in Glasgow under the presidency of Dr. Andrews, as the health of Sir Robert Christison, M.D., the President elected at last meeting, did not justify him in undertaking the onerous duties of presiding. It is somewhat curious that photography, which in its earlier days was a constant subject of interest at the British Association, has of late years occupied less and less of its attention, the present meeting being probably the most barren of photographic interest of any meeting hitherto held. There are probably two primary reasons for this. In its earlier years, photography was definitely affiliated to physical and chemical science, and more recognized in this relation than it has been since it has assumed the form of a distinct industry. In its infancy, photography had almost everything to gain from being associated with chemical science, whilst chemistry, in turn, received aid from the developments of photography. At the same time, photography became a favourite subject for study and experimental research amongst the most eminent men of science: Sir John Herschel, Sir David Brewster, Fox Talbot, and a host of others in this country, and their peers in France and other countries. These *savans*, and their contemporaries of like interests, have passed away, and there is probably not a single scientific man of high eminence who makes photography, or the science of light in its relation to photography, a subject of research or experimental investigation. There are, moreover, but few novelties of even a practical nature likely to interest the Association, and few members as readily disposed as in former times to prepare papers on the subject.

The President this year, essentially a devotee of science, read a pre-eminently practical paper, reviewing the actual progress of science, avoiding the realms of speculative philosophy. In an interesting glance at the observations of the Transit of Venus, he duly recognized the value of photography. He said:—

> Photography lent its aid to record automatically the progress of the transit, and M. Janssen contrived a revolving plate, by means of which from 50 to 60 images of the edge of the sun could be taken at short intervals during the critical periods of the phenomenon.
>
> The observations of M. Janssen at Nagasaki, in Japan, were of special interest. Looking through a violet-blue glass he saw Venus two or three minutes before the transit began, having the appearance of a pale round spot near the edge of the sun. Immediately after contact the segment of the planet's disc, as seen on the face of the sun, formed with what remained of this spot a complete circle. The pale spot when first seen was, in short, a partial eclipse of the solar corona, which was thus proved beyond dispute to be a luminous atmosphere surrounding the sun. Indications were at the same time obtained of the existance of an atmosphere around Venus.
>
> The mean distance of the earth from the sun was long supposed to have been fixed within a very small limit of error at about 95,000,000 miles. The accuracy of this number had already been called in question on theoretical grounds by Hansen and Leverrier, when Foucault in 1862, decided the question by an experiment of extraordinary delicacy. Taking advantage of the revolving mirror, with which Wheatstone had some time before enriched the physical sciences, Foucault succeeded in measuring the absolute velocity of light in space by experiments on a beam of light, reflected backwards and forwards, within a tube of little more than thirteen feet in length. Combining the result thus obtained with what is called by astronomers the constant of aberration, Foucault calculated the distance of the earth from the sun, and found it to be one-thirtieth part, or about 3,000,000 miles, less than the commonly-received number. This conclusion has lately been confirmed by M. Cornu, from a new determination he has made of the velocity of light according to the method of Fizeau; and in complete accordance with these results are the investigations of Leverrier, founded on a comparison with theory of the observed motions of the sun and of the planets Venus and Mars. It remains to be seen whether the recent observations of the transit of Venus, when reduced, will be sufficiently concordant to fix with even greater precision the true distance of the earth from the sun.
>
> In this brief reference to one of the finest results of modern science I have mentioned a great name whose loss England has recently had to deplore, and in connection with it the name of an illustrious physicist whose premature death deprived France, a few years ago, of one of her brightest ornaments—Wheatstone and Foucault, ever to be remembered for their marvellous power of eliciting, like Galileo and Newton, from familiar phenomena the highest truths of nature.

Speaking of light as a Force, he remarked:—

> In the solar beam we have an agent of surpassing power, the investigation of whose properties by Newton forms an epoch in the history of experimental science scarcely less important than the discovery of the law of gravitation in the history of physical astronomy. Three actions characterise the solar beam, or, indeed more or less, that of any luminous body—the heating, the physiological, and the chemical. In the ordinary solar beam we can modify the relative amount of these actions by passing it through different media, and we can thus have luminous rays with little heating or little chemical action. In the case of the moon's rays it required the highest skill on the part of Lord Rosse, even with all the resources of the observatory of Parsonstown, to investigate their heating properties, and to show that the surface of our satellite facing the earth passes, during every lunation, through a greater range of temperature than the difference between the freezing and boiling points of water.
>
> But if, instead of taking an ordinary ray of light, we analyse it as Newton did by the prism, and isolate a very fine line of the spectrum (theoretically a line of infinite tenuity), that is to say, if we take a ray of definite refrangibility, it will be found impossible by screens or otherwise to alter its properties. It was his clear perception of the truth of this principle that led Stokes to his great discovery of the cause of epipolic dispersion, in which he showed that many bodies had the power of absorbing dark rays of high refrangibility and of emitting them as luminous rays of lower refrangibility—of absorbing, in short, darkness and of emitting it as light. It is not, indeed, an easy matter in all cases to say whether a given effect is due to the action of heat or light; and the question which of these forces is the efficient agent in causing the motion of the tiny discs in Crookes's radiometer has given rise to a good deal of discussion. The answer to this question involves the same principles as those by which the image traced on the Daguerreotype plate, or the decomposition of carbonic acid by the leaves of plants, is referred to the action of light and not of heat; and applying these principles to the experiments made with the radiometer, the weight of evidence appears to be in favour of the view that the repulsion of the blackened surfaces of the discs is due to a thermal reaction occurring in a highly rarefied medium. I have myself had the pleasure of witnessing many of Mr. Crookes's experiments, and I cannot sufficiently express my admiration of the care and skill with which he has pursued this investigation. The remarkable repulsions he has observed in the most perfect vacua hitherto attained are interesting, not only as having led to the construction of a beautiful instrument, but as being likely, when the subject is fully investigated, to give valuable data for the theory of molecular actions.
>
> A singular property of light, discovered a short time ago by Mr. Willoughby Smith, is its power of diminishing the electrical resistance of the element selenium. This property has been ascertained to belong chiefly to the luminous rays on the red side of the spectrum, being nearly absent in the violet or more refrangible rays and also in heat-rays of low refrangibility. The recent experiments of Prof. G. W. Adams have fully established the accuracy of the remarkable observation, first made by Lord Rosse, that the action appeared to vary inversely as the simple distance of the illuminating source.

The usual soirees, excursions, and visits to manufactories have taken place, and given much satisfaction. The evening lectures were also successful. In the lecture by Professor Tait on Force, he somewhat startled the audience by an allusion to the ignorance of Professor Tyndall on subjects of which he professed to be an expositor, and pointed out, referring manifestly to the Belfast Inaugural Address, how unfit were such men to shake the faith of mankind by their own vague and unscientific speculations. He said:—

> One of the worst blunders of the much-lauded early paper of Mayer, upon which an attempt was made to found for him the full claim to the original discovery of the conservation of energy, was reproduced in an intensified form by Dr. Tyndall in his discourse on what he erroneously called "Force." As that discourse involves essentially a good deal of the particular kind of error to the exposure of which my present lecture has been devoted, I may fitly finish with a brief examination of some of the most inaccurate of those made. Here they are from the *Philosophical Magazine* for July, 1862, where they form part of a paper which has already been effectively commented on, but mainly from an historical point of view, by Sir William Thomson and myself:—"The absolute amount of work done depends solely upon two things—first of all on the quantity of matter that is lifted, and secondly on the height to which it is lifted. If you call the quantity or mass of matter M, and the height through which it is lifted N, then the product of M into N, or M N, expresses the amount of work done." Now the words "quantity or mass of matter" are perfectly definite, and cannot possibly involve anything beyond a numerical multiple of the unit of mass. The height to which the mass is raised is, of course, a simple numerical multiple of the unit of length. The product of these two qualities thus defined by Dr. Tyndall as "woak done"—*i.e.*, the product of a mass into a length—is not as yet recognised in physics at all. He had seen that work or energy essentially involves two additional factors—viz., a numerical multiple of the unit of length directly, and of the square of the time unit inversely. One of the extraordinary mistakes involved in such a statement as that which I have just quoted will be obvious to every one of you

when I point out that the statement involves no mention of gravitation whatever, so that according to such writers, the work done in lifting a load in no way depends upon the earth's attraction, but would be exactly the same whatever were the mass of the earth. Perhaps nothing so rich, and yet so sad, as this has been published as science since a scientific author, supposed to be the late Lord Brougham, undertook, at short notice, to write one of the earlier treatises of the "Library of Useful Knowledge." All but a very few copies were recalled; but in those which were not destroyed, we are told that a porter carries a load on his shoulders rather than in his hands, because it is thus lifted at least twice as high above the earth, and gravity diminishes as the square of the distance from the attracting body increases. When I find men who make these blunders in science, where at least in the elements accuracy is not only indispensable but easily attainable—when I find these men unsettling by vague and altogether unscientific speculations the cherished beliefs of their fellow-men, on matters of unutterably greater moment, I conceive that I am morally bound, in season and out of season, to take every possible opportunity of showing the true value at which to estimate their scientific authority. Shall "these be thy gods, O Israel?"

In the sectional meetings there was little of special interest to photographers. A paper by Mr. Howard Grubb, on a means of "Photographing Defects in Optical Glass," will be found on another page. Dr. Janssen made some interesting remarks on "Solar Photography with Reference to the History of the Solar Surface," and referred to the importance of having continuous photographs of the solar surface, and explained the method by means of which he had obtained accurate large photographs, which showed the mottled appearance of the sun's surface. He suggested that if these photographs could be reproduced on paper they could be interchanged between the different observatories, and thus most valuable results could be obtained.

Dr. Janssen also read a paper stating the results he had obtained in Siam during the solar eclipse in April, 1875, one of the chief results being to clear up some obscurities about the atmospheric effects of the eclipse. He also referred to the results of the English expedition, which, he said, confirmed the conclusion he had himself arrived at, that the corona and the chromosphere were two distinct layers of the solar atmosphere, the green line of the corona not being visible in the protuberances. Mr. Schuster alluded to the great importance of Dr. Janssen's observations at the transit of Venus, during which he had seen the body of Venus detached from the corona before Venus had entered the disc of the sun.

In the Mechanical Section Mr. Lavendar described a new lamp. He said the lamp he had invented was capable of being used in collieries, railway yards, and public works, and its particular efficacy was to give increased light at little cost. The peculiarity of the lamp was that a jet of steam was introduced, the object of which was to create a partial vacuum in the lantern, the consequence being that a circuit of air was forced through the burner, and there was almost a complete combustion of the oil, and a brilliant light was produced, which was increased partly owing to the products of combustion being completely removed. Sir John Hawkshaw believed that the lamp was well designed for the object in view, and a vote of thanks was awarded the author.

In the section for considering Economical Science, Mr. St. John Vincent Day read a paper on "Recent Attempts at Patent Legislation" He confined his attention to the Bill of 1876, which he described as in many respects an improvement upon its immediate predecessor of 1875. In so far as the Bill provided for the examination of applications for patents, it might be welcomed as a proposal for the introduction into the English patent law of a system which had been found on the whole to work well in the United States. He would still maintain the system of filing a provisional specification, and he would grant protection therein as at present.

Mr. Trevelyan said he would abolish the patent laws altogether, and he would give every facility to the inventor for protection by simply paying £5 for the registration of his invention. He believed that many useful inventions were lost because of the great expense of procuring patents.

Mr. Macknight said he was surprised to find that the surplus revenue from the Patent Office amounted to the enormous sum of £110,000 a-year. He deprecated such a tax placed upon invention.

Mr. Bramwell, C.E., said that, though the Bill of 1876 was better than the one of the year before, he believed that it would nevertheless be destructive to the interests of patents.

One of the most lively discussions during the week of meetings arose on the subject of "Spiritualism;" but the details cannot claim space in our pages, as the subject in its alleged relation to photography did not arise.

The next meeting will be held at Plymouth, on the 15th of August, 1877, under the presidency of Dr. Allen Thomson. Dublin is nominated as the place of meeting for 1878.

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PHOTO-PLASTO-GRAPHICAL NEGATIVES.

Few things are more curious in the history of photography than the persistency with which certain ideas recur, each time as novelties, often to be the subject of repeated patents, whilst, notwithstanding the attractiveness and apparent value which induces this repetition of the trouble and expense of patenting such ideas, seem to fail at all times to gain general appreciation or adoption. They are discovered, patented, and forgotten. We have more than once within the last few years called attention to patents for producing certain effects of softened or artistic definition in portraiture by aid of various mechanical operations. The crisp, keen, almost cruelly sharp, definition has been felt by many to be in antagonism not only to refined artistic feeling, but to nature as actually seen by the human eye. Sir Wm. Newton, a distinguished artist, and one of the first vice-presidents of the Photographic Society, at the first meeting of that society, advocated taking photographs a little out of focus as giving an effect of greater breadth, more suggestive of the true character of nature. The great difficulty of getting satisfactory results by Sir William's method arose from the fact that in taking pictures out of focus with a good lens, when every plane in the picture was somewhat out of focus, some were necessarily offensively so. Various methods of producing similar results without this disadvantage have since been proposed.

Printing through various mediums was suggested, and the plan of interposing a thin sheet of glass between sensitive paper and negative in printing, using direct sunlight, was found to give singularly soft results. Various other methods were tried, and finally the use of two identical negatives superposed one upon the other was adopted by many as giving the finest results, the celebrated effects of Denier being, it is supposed, produced by that method. This method was first patented in the United States by Mr. E. G. Foux, about half a dozen years ago. A year or two afterwards the method was re-discovered and patented on the Continent. About three years ago an improvement upon this method was discovered, and communicated to our pages by a Canadian amateur. His plan consisted in coating both sides of a plate of glass with collodion, and, after sensitizing, exposing the plate, which received two images simultaneously—one, a vigorous one, on the front of the glass, and the other less vigorous, at the back. The two images gave a singularly soft, and in many respects pleasing picture. This method was subsequently re-discovered and patented in the United States by Mr. Kirk, of New Jersey. A similar method was also patented, we believe, by an Italian photographer, and it has been more than once sold as a secret process. In a specification recently issued of a patent obtained in this country by Adolph Hommel, of Prussia, we find the same idea again re-discovered and protected, the patent having been sealed in this country in February last. It is a pity that his patent agent was not sufficiently familiar with the history of the process to save Herr Hommel the expense of a patent so manifestly inoperative. as the process is free to every photopher to practise. The specification runs as follows:—

> I cover a glass plate, cleaned on both sides, with a skin or film of sensitive collodion rendered sensitive for the light of the sun or daylight by steeping it in a bath of nitrate of silver, and I take a copy of the person or of the object to be photographed in the camera in the ordinary way, and thus two latent images are produced, one in the recto or front, and the other in the verso or back, and I develop, fix, and cover both these images with a preserving varnish. I call this double negative, produced at the same time upon both sides of a glass plate, a photo-plasto-graphical negative, and the copies which I can take from it photo-plastographs. By producing a photographical negative on one side of a glass plate, as at present, there is a great loss of light reflected from the person or the object traversing the sensitive skin of collodion, and even if the negative image furnishes good and receivable copies, they have to be reinforced or strengthened by chemical reagents, an operation which produces well-known differences requiring artificial aid or retouching. The essential advantages of the invention are as follows:—*First*, I receive upon the sensitive skin of collodion in the verso or back of the glass plate the light which is traversing the skin of the recto or front, thereby rendering it efficacious, and thus I obtain from the person or from the object a maximum effect of the light upon the glass plate, and I do not alter or destroy by an ulterior working the harmony between light and shadow. *Secondly*, the supplementary negative upon the verso or back of the plate receives, by the refraction of the rays of light traversing the plate, a small enlargement, which has the advantage that in copies of the negative the sharp outlines or contours on the recto or front of the plate will be diminished and rendered softer, and thereby obtain, without retouching, very soft copies of perfect images, which cannot be produced in any other way than in that hereinbefore described. The copies taken from a photo-plastographical negative will be made by employing a dispersed light, the light rays falling nearly vertically upon the plate, and the production of photo-plastographs by superposing two or more negatives, prepared in the hereinbefore described manner, are the results of this invention.
>
> Having thus described the nature and particulars of the said invention, as communicated to me, I claim the improvements in photography substantially as herein described.

A NATIONAL SCHOOL OF PHOTOGRAPHY.

BY GEORGE CECIL HANCE.

No. I.

I have long been of opinion that photography can neither be looked upon, or rather be recognized, in the same way as painting and the fine arts, nor that photographers themselves can hold an even rank in society, in communion with painters and sculptors, until such time as there shall be a National School of Photography which will grant certificates to students, and also degrees to qualified operators. I was talking to a photographer some few days ago on the above subject, and while he acknowledged the desirability of such an institution being founded, yet he wished to know who were to constitute the governing body, as it would require men of practical as well as theoretical knowledge to be able to grant degrees and certificates. Now I think that if all classes of photographers would combine, a council or governing body *pro tem.* might be easily formed of the following materials, for as there are many component parts in photography, so ought the council of the school to be formed. I would propose, therefore, twelve gentlemen of the following qualifications:—Three well-known chemists, whose having passed the Apothecaries Hall ought to be a sufficient qualification for photographers that they understand their business; three artists, either painters or sculptors, Royal Academicians; three well-known professors of science, or examiners therein; and three military photographers, officers of the Royal Engineers, &c. (I specially mention the latter, because we must believe that as they have been appointed to such posts by the War Office and military authorities, they must know something about photography, and because it would be most desirable that a photographer of some sort or another should be on the council, although it would be best if it was not an ordinary *professional photographer*, so as to prevent any thoughts of favoritism in granting degrees and certificates.)

The school should be founded on a similar plan to the National School of Art, and a certain *fee should be paid* by the students, with two *yearly* sessions; operating, printing, and other rooms, together with all the necessary apparatus, being the property of the school. Chemicals and materials to be used by the student, should be paid for by them, on exactly the same principle that now exists in art schools, where casts, models, easels, and general furniture ,are supplied, and are the property of the school. Colours, chalks, brushes, pencils, &c., are provided by the students themselves. By this rule being strictly enforced, it would prevent at any time any commercial business being transacted by the school, for whatever the students spoilt or wasted would be their own property, and not that of the council. In a school of art, if a student spoils fifty sheets of drawing-paper, or a dozen canvasses, he is paying for the same, and he is much more likely to use every piece of paper to its best advantage, in order to save his own pocket.

Of course there would have to be a head master chosen by the council, with under-masters, to instruct separate divisions, viz., operating, posing and grouping, printing. retouching, &c.; and with eminent gentlemen either in arts and sciences to give lectures on all subjects likely to be of use in connection with photography; and there would, of course, be daily lectures by the masters and others for the benefit of the student.

I have no doubt that in course of time Government would be induced to look with favour on the school, and a national grant would be yearly given in aid of its funds. And with regard to a degree, I would recommend the institution of one such as this, "Fellow of the National School of Photography;" and in order to obtain such a degree, a similar ordeal as that passed by the Associates of the Royal Acadamecians themselves would have to be undergone, and that a photographer, before he could put "F.N.S.P." after his name, must necessarily understand, both practically and theoretically, everything that it is possible at the present time for any one to know in connection with photography. Degrees and certificates would of course be entirely distinct, because certificates would only indicate that a young man had passed through the school according to its regulations, and to what success he had attained; but degrees would be an after honour and prize.

Depend upon it, that this country would never have boasted of so many honoured names in the art if there had not been such things as A.R.A. and R.A.; and although there is A.R.H.A. and R.H.A. in Ireland, A.R.S.A. and R.S.A. in Scotland, it is the R.A. of old England that is the most highly prized. And it is the winning of that that has cheered on so many students, to whom, though unsuccessful one time, it has given renewed courage for a second attempt. And as it is so in painting, &c., why should it not be so in photography? And, again, there might be a yearly exhibition of the works of the students of the school, showing to whom medals and certificates had been awarded. I much wish to see the day when such an institution shall be opened, and I am perfectly certain that no photographer will ever regret having been one to come forward to assist in such a project for the elevation and advancement of the photographic art. And as far as my own poor abilities are concerned, I would gladly volunteer them to aid in the formation of "A National School of Photography."

A TRIP TO THE HEBRIDES.

BY REUBEN MITCHELL.*

There was much grand scenery in all directions, which caused a bewilderment of pleasure, seeing we had so much to select from,—pictures in all directions. We had a stroll up the side of the burn—a wild, rocky, tumbling stream, leaping over ledges of rock into pools below in most picturesque forms, then flowing on in its sinuous course to the sea loch. About a mile from the hotel some of the pools are tempting bits, both to the lovers of art and the rod; many fine trout are revelling in the foam caused by the falling water, and easily become a prey to the tempting worm or fly cast to entice them to take the fatal bait; often have we seen them brought dangling to land, to the great delight of the successful sportsman. We returned to the hotel, and dined at two o'clock, after which we unpacked and made all preparations for commencing in good earnest, if favourable on the following morning. After breakfast, it being a splendidly fine morning, we were soon at work on the banks of the burn, taking photos. of lots of cascades. Coming to one lovely spot— such a charming picture—I set to work to make a sketch in water-colour of the burn and rock for a foreground, and the peaks of Scuir-na-Gillian, with clouds playing about, sometimes almost enveloping the mountains, and at others leaving them partially bare—a most enchanting subject.

Having done what we considered a good day's work, we returned to the hotel with keen appetites for dinner, at 6.30 p.m., after which we had a stroll to the sea loch, apparently, at a distance, a small waterfall, but on approaching nearer it increases in magnitude, and in rainy weather becomes quite a conspicuous object in the landscape. A considerable strath, with peat stacks and bog cuttings, with the river Sligachan wending its way to the loch, make up a splendid picture, with a very fine background. I afterwards made two sketches of this charming view. The loch is of considerable size, and is connected with the sea. The road from Sligachan to Broadfard runs along the east side of the loch. There are numbers of cottages for the fishermen on the margins of the loch, but these I intend noticing further on.

On the following morning, after breakfast, we commenced operations in our favourite burn, both sketching and photographing, and made a satisfactory day's work. The next day being Sunday, we had a day's rest. The nearest church being 9½ miles, we contented ourselves with wandering about, admiring the grand scenery of this most charming glen and mountains.

Our next operation was in a most picturesque and wild chaotic-looking ravine, with a small meandering stream wending its way through large masses of rock, which in some parts almost block up the ravine, and make it impossible to get either to sketch or photograph. The morning was most favourable, so we had our instruments taken to a considerable distance above the ravine to a very charming pool and waterfall, with a good mountain background, which makes a good composition. Our next was at the head of this extraordinary ravine—a pool waterfall emerging through the rocks in a winding stream, appears as if it came out of the cavern and into the pool below. Our next is more wild looking, but very grand—an immense wall of rock on each side, and blocks of rock in the ravine large enough to make an engine bed, and others strewn about in all directions, the limpid stream wending its way as best it can. Our next was still lower down, of the wildest character, for large masses of rock had fallen from one side, literally choking the ravine. I observed to my young friend that when the Boltonians saw these photographs they would think we had brought home pictures of chaos, for such wild confusion is rarely ever seen, as few take the trouble, which is by no means of a light character, to secure pictures in such difficult and rugged places. Although we had a splendid morning, it commenced raining at intervals about three o'clock, but we still persevered with our work, and finished the day in this most interesting place, leaving one view for a future occasion. Our assistants having arrived, we had our instruments taken to the hotel, which is only a short distance, and, tired with scrambling about, we were prepared to do ample justice at dinner.

I may here state that mine host and hostess of the Sligachan Hotel are excellent caterers for the inner man of their guests, not in rich delicacies, but in good substantial fare, and a very liberal supply. Scrambling about and climbing mountains, with pure air and water, brings visitors to table with keen appetites; every man may leave the table well satisfied with himself, and at peace with all the world, after the enjoyment of a good dinner in so bracing and healthy a climate. After dinner I began to look about for some place to develop our plates, as we had exposed a considerable number. A shed was the only place that appeared likely; we could not commence till dark. Mr. Butters supplied us with a man to attend on us, also other things which we required. There were several empty beer barrels about in the shed, so one of these set end up did duty for a plate holder or developing stand, which answered admirably for my large plates.

(To be continued.)

SOME EARLY DRY PLATES.

Mr. H. T. Anthony, in the *Bulletin*, gives some facts relating to the early history of dry plate work in America. He says:—

"In a report of proceedings at a meeting of the American Institute, Photographic Section, the following remarks were made by the President:—

"'Being one day in the office of Mr. Charles Wager Hull, he showed him (the President) the first dry plate negative ever made in the United States. He stated to him that it was developed entirely with tannin, no other developer being used, except tannin and silver.'

"As this impression of Mr. Newton as to the date of the first dry plates made in this country is erroneous, I will merely state, as a matter of fact, that negatives upon dry albumen plates had not only been made anterior to that time, a patent having been taken out for the process, but I myself had done a great deal of dry plate work experimentally and successfully. The first successful collodion dry plate negatives I made were by using the ordinary collodion immersed in the acetic acid silver solution, washing well, and flowing over it a two-grain solution of gallic acid in cold water. With this mode of working I had made very rapid dry plates. I remember, especially, one, a print from which I sent to Mr C. Guillon, of Philadelphia, in which I obtained an excellent picture of a building in process of erection, in which all the masons and workmen were taken in the act, almost instantaneously. The development was effected by pyrogallic acid, acetic acid, and silver. It was a considerable time subsequent to my successful experiments in dry plates that Mr. Hull showed me a similar negative that Mr. Newton speaks of, describing it as made by a new process, in which the developer was used as a preservative. The mode of working was kept secret for a while, and it was not until after the lapse of considerable time that the mode of making these negatives was communicated to me. It will thus be seen that, as far as my experience goes for anything, the idea of employing a developing substance as a first wash was one of the earliest in connection with dry collodion work. My object, however, was not that of using it as a preservative, but as an accelerator in connection with the trace of nitrate of silver left in the film. Subsequently, to make the plates keep well, I gave them a wash in an exceedingly weak solution of chloride of ammonia, and then flowed the plate with the gallic acid solution. Another instance of the application of a developing substance to dry plates may be told in regard to the employment of a developer in connection with a preservative. This was the use of protosulphate of iron with gum tragacanth. Having tried gum tragacanth alone as a preservative, and finding it impossible to get more than a trace of a picture by its means, I attributed the result to the difficult solubility of the gum, by which the developer used was prevented from penetrating to the collodion film. It occurred to me then, that if a strong developer was mixed with the gum tragacanth, it might overcome the trouble. Upon mixing a small quantity of protosulphate of iron with this preservative, the difficulty was entirely overcome, and very strong and brilliant negatives produced. I also made very brilliant transparencies in the same way. Gum tragacanth is very difficult to diffuse in water; but, by adding a little glacial acetic acid to the water, it becomes very easily dissolved.

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* Continued from page 425.

"These remarks are made, not egotistically, but as a statement of facts, and with the feeling that any statement of practical results may sooner or later be of value in some way or other to the profession."

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Correspondence.

YELLOW SPOTS IN PRINTS.

Dear Sir,—The remedy quoted by Messrs. Marion does not, I fear, explain the true cause of those minute spots which so frequently are seen on the white parts of silver prints. If carefully examined, it will be found, as a rule, that a black speck appears in the centre of each spot, and around these particles of metal the unfixed silver converges and describes a circle composed of the insoluble hyposulphite of silver. The origin of these defects can in a few moments be traced by any photographer who, on behalf of himself and his printer, will consent to expend a few minutes in front of the hypo bath when the prints are passing through the stage of fixation. When removed from the water, the prints are submerged in a fluid of a comparatively high specific gravity. A well known law is thus made to operate, and the fixed air that is confined within the texture of the paper makes its escape wherever the surface presents open pores. Thus bubbles are formed, which prevent the hypo having free play. The results are that the print is speckled over with a rash that consists of the insoluble hyposulphite of silver. The remedy to be applied is obvious and easy. Submerge the prints, face upwards, and by simultaneous action the left hand should hold the paper firmly whilst the back of the right hand is passed quickly over the surface of the print. If this is done neatly and in time, the air-bells are removed, the hypo has free access, and the evil of yellow spots is reduced to a minimum which need not create alarm or vexation.

What a multitude of troubles might be averted if men would only make a right use of their eyes.—Yours truly,

W. T. Bovey.

[The cause of yellow spots here described by Mr. Bovey, which is one of those referred to in our last, is very common and mischievous, and if its early symptoms—which he has very accurately described—be carefully noted, many prints may be saved from the spotty destruction which is so common. But there is another class of yellow spots the origin of which we have not been able to trace. They are irregular in shape, very pale in tint, and without any central nucleus. We should be glad if Mr. Bovey or any of our correspondents will aid us in tracing these to their source, which as yet we have not seen indicated.—Ed.]

Dear Sir,—In response to Messrs. Marion's letter and your appeal, I have used acetic acid in the shape of common vinegar for a long time past in the first water used for washing the prints before toning, and am totally unacquainted with the appearance of yellow spots either before or after mounting. My reason for using the acid is that I have a good deal of fumed paper. I do not know that it is either advantageous or desirable with the paper unfumed.

I think Messrs. Marion's friends must look elsewhere for the cause of their yellow spots.—Yours truly,

Norbiton, September 12th. Russell Sedgfield

Sir,—Having read Messrs. Marion's letter, in your last issue, respecting the yellow spots in prints, I am induced to send you my experience, as for the last twelve months—and not until then—I have been a victim. I have not the slightest hesitation in laying it in my case to the gold printing, having "hunted it to its source," and had convincing proof that it proceeded from no other cause.

For twelve or thirteen years I knew nothing of yellow spots except through the photographic journals, and the said spots came as entire strangers on my adoption of gold-printed cards. My printers have never to my knowledge used acetic acid in connection with toning, and a further proof of the cause of the spots is the fact that the whole of the unmounted prints are entirely free from them.

I was recently photographing a drawing room interior, and during exposure curiosity prompted me to overhaul a card-basketful of photographs. Amongst them was one, and only one, gold-edged and gold-printed card. It bore the name of a leading firm of photographers, and it was the only one in the whole batch that was covered with "yellow spots."

I find the gold attacks the print chiefly while in a moist state. The best plan (suggested by Messrs. Marion) is to dry them very quickly after mounting. I bake mine for two minutes in a hot oven; but I have no confidence even in this treatment, for if left subsequently in a damp place (probably by the customer), I believe the gold would resume its destructive action to a certain extent; for I am quite positive the evil is not simply confined to the sprinkling of gold dust on the face of the print, but commences its action also on the back, and eats completely through it; the impression from the back of one card being communicated to the face of another, when packed and sent out by the manufacturer.—I am, sir, yours very truly,

Bromley, Kent, September 11th. R. V. Harman.

[The examples enclosed thoroughly bear out our correspondent's remarks. One card with this injurious gold printing may spoil dozens with which it comes into contact.—Ed.]

Sir,—As an old printer, and one who has printed as many photographs as any one, I wish to state what I consider the cause of the minute yellow spots on prints. It is either the albumenized paper being porous and absorbing during fixing certain small quantities of hyposulphate solution, through the back of the print, which remains between the paper and the albumen surface, or in taking the prints from the fixing bath. Minute air-bubbles are formed on the surface of the print, which, unless the prints are quickly and thoroughly washed, at once prevent the hypo from being washed from those places where the air-bubbles are, and in the morning it is found that the prints, or some of them, are covered with these tiresome yellow spots. As a proof of what I say, if you take a print from the hypo and lay it on one side without washing until the morning, you will find it quite yellow and faded, identical in colour with those yellow spots.—Yours truly, T. O.

P.S.—I may say, I have my prints thoroughly washed and squeezed immediately after taking them out of the hypo, and have not had a single yellow spot for more than a year.

THE LATEST SUBSTITUTE FOR GROUND GLASS.

Dear Sir,—There have been many good suggestions for a substitute for the ground glass of the focussing screen, but I don't think such a simple one as the following has ever been suggested.

If the ground glass of the focussing screen get broken when one is several miles from home or any place where one could obtain another, or a substitute, the only thing left is to pack up the apparatus, &c., and return, by no means pleased with the day's work; at least, so most photographers would think. If, however, they had, in such cases, adopted the following plan, I have no doubt many a photographer would have done a good day's work instead of returning home.

If I break my focussing glass when I am several miles from home, and have no ground glass with me, I remove all the pieces of the broken glass from the frame, and put a piece of clean plain glass in its place (for one is nearly sure to have a glass plate near enough to the size to answer this purpose). I then place the screen in the camera, throw the cloth over my head, and breathe heavily until the glass is covered with enough moisture to assume the appearance of ground glass. I then quickly focus the view.

I have no doubt if photographers adopted this simple plan they might often save a good day's work.—Yours truly, R. N. P.

Talk in the Studio.

West of England Photographic Society.—The Amateur Photographic Association of Bristol is making an attempt to extend its operations, and by gaining new blood to secure new vitality. In a Bristol journal we notice an appeal to the photographers of the district to join their brethren of the existing association, and so form a West of England Society. We subjoin a portion of the advertisement:—"It is confidently hoped that a large number of gentlemen will become members who would not otherwise have done so, thereby making it one of the largest and most important of societies. As the winter session is now at hand, all gentlemen wishing to be enrolled are requested to send in their names, *as early as possible*, to the undersigned, who will afterwards call a meeting to elect officers and draw up rules for the intended new basis of the association.—H. A. H. Daniel, 49, Broad Street, Bristol."

South African International Exhibition, 1877.—An International Exhibtion will be held in Cape Town in 1877, in a building to be erected for the purpose, by the consent of the Colonial Government. It will include maufactures of all kinds. The date fixed for the opening is February 15th, and everything intended for the Exhibition must be shipped from London not later than during the first week in December, 1876. Intending exhibitors should communicate immediately with Mr. Edmund Johnson, Commissaire Délegue at the European Central Offices of the Exhibition, 3 Castle Street, Holborn.

Matt Silver Stains.—A correspondent of *Anthony's Bulletin* says:—"During the excessively hot weather I—and I suppose others likewise—have been very much troubled with a formation of 'matt silver,' or a thick grey deposit on the negative plate, taking a great variety of forms, from a clam shell to all the fantasies of a frosted window: and, after trying all the remedies known to 'photo. mat. medica,' the apparition refused to vanish. I have finally achieved success by simply dipping the plate, after exposure, in the bath for the space of one minute. This I find considerably shortens the exposure, while it materially adds vigour to the negatives."

Effect of Light on Selenium.—"Lieut. Christie, R.E," says *Nature*, "writing to us from Madras with regard to the use of selenium in telegraphy, says that if we could do away with the man (or woman) signaller, and substitute a commutator actuated by a current of electricity generated by the action of light upon a piece of selenium, we should (supposing the sensitiveness of the selenium to be adequate) have a combination capable of enormously increased rapidity. The message to be transmitted would be first set up (by mechanical means) in the Morse character, in long and short *slits* in an opaque screen; and this perforated screen being passed rapidly between the selenium and a source of light, the currents of electricity would be generated which are required for actuating the commutator. The possibility of such a combination depends on the sensitiveness of selenium to the influence of light. Assuming the combination to be possible, the rapidity of signalling would seem to be limited only by either the mechanical conditions of the commutator (or relay), or the power of the printing instrument at the receiving station."

To Correspondents.

⁂ A number of answers must inevitably stand over until next week, a parcel of "copy," containing the Editor's answers to many queries, having gone astray in the Post Office.

C. Reid.—We cannot state with certainty the cause of the spots on your prints. They are not unlike those caused by air-bells on the prints during fixation, causing minute points of imperfect fixation. But without watching the stages of production it is not always easy to decide the origin of such spots. See letters and notes on the subject on another page.

F. M. Sutcliffe.—Our experience of George's calorigen is very satisfactory, and for use in the studio and dark room we should prefer it to any stove we know. We have never tried varnishing a negative by its heat, but we have no doubt that it would serve. For the waiting room one with coal would probably be better. There is some omission in your letter. The second sheet commences with the words "send by post," but nothing is said of what has to be sent. The head is very fine, and the lighting by no means unsatisfactory. Regarding spots, see letters and notes on another page. The precise cause in card sent we cannot with certainty say. We are glad to hear of your more promising prospects.

Young Amateur.—A magic lantern may be employed for producing enlarged transparencies; but the exposure will be somewhat long. A correspondent some time ago gave us details of his experience. He said:—"Very good transparency enlargements can be produced with paraffine and a good lantern. Those who wish to try this method of enlarging will find they can produce a three and a half or a four inch vignette head on a ten by twelve wet collodion plate, with iron development, with an exposure of seven or eight minutes. Pyrogallic development may be used, but the exposure may be calculated at about four times as long. My lantern is fitted with a three and a half condenser, used in connection with a quarter-plate lens. The lamp I use is known as a passage lamp, having a wick seven-eighths of an inch broad. There are only two points to be attended to in the use of a lamp of this description: first, the body holding the oil must be kept cool; secondly, the flame must be turned edge on, or nearly so, to the condenser, as the illumination is much better in this position."

G. C. Hance.—Thanks. The subject is an interesting and important one. We shall be glad to hear your further suggestions on the subject, and shall then probably have something to say.

Received.—J. J. Atkinson's Catalogue of Photographic Specialities; Mr. F. York's Photographs from South Kensington Museum, Part II.

Several Correspondents in our next.

Errata.—In last week's "In and Out of the Studio," for "city magistrates," read "city magnates."

PHOTOGRAPHS REGISTERED.

Dr. J. Gale, Newton Abbott,
  Two Photographs of Boat-house of Torquay Life Boat.
Mr. Gregson, Luton, Beds.,
  Photograph of Colonel Somerset's coach "The Hirondell."
  Two Photographs of Rev. J. Knipe.
  Two Photographs of Edward Woakes, M.D.
Mr. Smartt, Leamington,
  Photograph of Rev. J. Kelly.

The Photographic News, September 22, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographic Printing upon Fabrics—Toughened Glass—Two Practical Receipts.

Photographic Printing upon Fabrics.—Besides the method of printing upon fabrics described in these columns a few weeks ago as having been patented by Mr. Edwards, another plan has recently been suggested, which differs considerably, however, from that gentleman's method. Mr. Edwards' process, as our readers know, is simply the ordinary method of Collotype reversed. He produces upon bichromated gelatine an image by printing under a cliché, and thus renders portions of the gelatine surface non-absorbent, while others remain absorbent of water. In the ordinary way this block, after wiping with a wet sponge, would have a roller in fatty ink passed over it, and the ink would adhere wherever the gelatine block was non-absorbent of water. Mr. Edwards' clever idea is to reverse matters, and to ink up, if we may so call it for a moment, not with a greasy body, but with a watery one, which is taken up by the absorbent portions of the gelatine, and refused by the non-aborbent portions which previously received the ink. This aqueous body is a dye of some kind in solution, and from the block impregnated with this dye it is easy enough to produce impressions upon fabric or paper. Supposing the latter to contain a mordant, the colours impressed are at once fixed, and thus a method of printing (or staining, rather) is at hand which should find a wide-spread application in our industries. The other plan of printing coloured designs upon fabric, to which we have referred, is to impregnate the latter, in the first place, with bichromate of potash, and then to expose the material thus treated under a cut-out design or cliché, and in this way produce an image of a reddish tone. The fabric is then put into a solution of madder, logwood, fustic, or similar colour, and the image, which acts as a mordant, alters its tint by appropriating some of the colouring-matter from the bath. Thus, if a fern-leaf is employed for printing from in the first place, and a piece of prepared stuff is stretched behind it, all those parts exposed to the light become changed, and on immersion in the colour bath assume a red tint; in this way, therefore, a white fern leaf on a pale red ground is obtained. We scarcely think this is such a practical method as that of Mr. Edwards, although it might doubtless be employed with advantage in many ways. But one of the most charming applications of photography to the printing of fabrics that we have ever seen was exhibited at the Photographic Exhibition in Pall Mall three or four years ago. Many of our readers still remember, no doubt, to have seen some white parasols with black lace at the top, which formed a beautiful contrast, and was altogether very tastefully arranged. The German firm of photographers who exhibited these specimens of photography applied to textile fabrics, told us that the cost of putting the delicate black lace upon the parasols was something under a penny, and as, to all appearance, it was of a very fine pattern, the price was certainly the reverse of exorbitant. As to the effect of the black lace upon the white ground, it was so deceptive that nothing but actual handling could convince one of its shadowy character. The folds were so accurately rendered, and the fall of the material so perfect, that the illusion was complete. The parasols exhibited were simply constructed of a white glazed material, which had been impressed, by means of a Lichtdruck or photo-lithographic process, with the black lace ornamentation. The only reproach that could be made in respect to such work is that which holds good against all "sham" articles; but we should nevertheless think that such things would command a ready sale in some quarters, at any rate. There is no reason why, however, if black lace can be reproduced so perfectly, other designs in other colours should not be printed. In printing upon calico and other fabrics large sums are given for happy designs, and one would think, therefore, that images taken from nature—whether leaves, ferns, or other objects—would be very acceptable. Blocks produced in the first place by photography could surely be secured just as suitable for printing upon textile fabrics as upon paper. No doubt, too, the plan of fixing colours in fabrics by means of bichromate of potash acted upon by light will receive further application than it at present enjoys, for it is a method which should fix pigments very firmly into the threads of the material. In other industries this useful salt has already received considerable application; builders, for instance, employ it for rendering walls waterproof, the same being coated with size mixed with the salt, or, in other words, with a dilute solution of bichromated gelatine, which, as a matter of course, becomes insoluble as soon as the light has acted upon it sufficiently, when in the form of a liquid it covers large surfaces exposed to daylight. Some use has been made, too, of the salt in admixture with gelatine as a substitute for waterproof or marine glue. We feel sure, therefore, that in the extensive industry of fabric printing, considerable assistance might be derived from the photographic art in one way or another.

Toughened Glass.—Practical experience of glass treated by M. de la Bastie's method scarcely bears out all the promises which were made on behalf of that material. So far as small glass vessels and measures are concerned—and it is but fair to say that our knowledge is confined to these—such utensils do not prove very much superior in point of hardness to those of ordinary glass. A glass measure allowed to fall a space of five or six feet upon a carpeted floor will not break if fairly thrown, but the chances are that an ordinary measure will not do so either. The fall in mention has, however, proved fatal in two cases to measures which were designedly allowed to fall upon their sides, and the result was the scattering of the glass in a thousand fragments. There were no sharp splinters or needles, however, to be found, and hence the fragments, although numerous, were not of a dangerous nature, as in the case of ordinary glass fragments. The greater part of the pieces were in cube or oblong fragments, and therefore not nearly so liable to cut and injure as the sharp slanting edges usually produced. By permitting one of Mr. Bastie's glass measures or vessels to fall upon its foot there seems to be little risk of breakage; but unfortunately, when a utensil slips from one's fingers, it does not always fall in the position most desirable for its safety. One thing in its favour is, that the hardened material is not expensive, and but a very little more is asked for articles fashioned from it than would be paid for ordinary glass objects.

Two Practical Receipts.—The two following receipts may be of value to some of our readers. The application of water glass or soluble silicate to wood or metal utensils, to protect them from the action of corrosive bodies, is sometimes desirable, and this material, a correspondent in the *Polytechnisches Journal* tells us, may be used with very little difficulty if you go the proper way to work. The wood or metal must be perfectly dry to begin with, and free from rust or any kind of fatty matter. Any of the pure mineral colours may be used for mixing with the silicate. Powdered lime, amounting to twenty or twenty five per cent. by volume, is mixed with the pigment, and double as much water glass is then added. The mixture is then applied in the same way as ordinary paint. An indelible ink made without the use of nitrate of silver, and therefore of a much more economical nature than that usually employed for marking linen and cotton fabrics, is to be obtained, according to the *Chemischen Centralblatt*, by mixing ten parts of coal tar with ten parts of benzole and one part of lamp-black. This simple mixture gives an ink which will withstand the action of chlorine. To render the ink thinner or thicker, more or less benzole is added.

THE PRESS AND THE EXHIBITION.

Up to the present we have seen but few notices of the Photographic Exhibition by the outside press. In the two we subjoin from the *Morning Advertiser* and *Telegraph* there is a curious discrepancy of opinion. The *Advertiser* seems to think "the art of sun painting has come to a standstill;" whilst the *Telegraph* is in raptures at the evidence of its "marvellous advancement." It is true, our appreciation of the opinion of the latter is somewhat qualified when we read what follows, and we feel in doubt as to whether the critic is chaffing some of the officers of the Society, or is unaware of the fact that gentlemen may hold an important scientific relation to photography without entering the arena of competition in points of practical skill. We incline to think it is simply from lack of information that the critic regrets the absence of examples of the peculiar and characteristic skill of Mr. Glaisher, the president, and Professor Stokes amongst the vice-presidents; and, ignoring Mr. Spiller's scientific relation to the art, speaks of the two interesting little portraits taken in the early days of photography as representative of the highest artistic grade in photography. Whether mischievous chaff or sheer ignorance, these things materially destroy the interest of the critique.

(Morning Advertiser).

The annual exhibition of photographs in connexion with the Photographic Society of Great Britain is again this year held in the well-lighted room of the Society of Painters in Water Colours, 5, Pall Mall East. In the present collection, which is arranged with care and judgment, there is nothing particularly striking. For a time the art of sun-painting seems to have come to a standstill. Of course old processes—how soon in these days that which is almost new comes to be spoken of as "old!"—are improved. The photographer of former days worked to a great extent in the dark. Now he proceeds on well understood principles, and with tolerable certainty as to results. Having attained a degree of perfection in the art that may well surprise the uninitiated, he appears for the moment either content to rest where he is, or to have reached such a standpoint as to regard further progress as improbable, if not impossible. The present exhibition, if it shows little advance on those of preceding years, is nevertheless a very interesting one. The leading photographers, amateur and professional, are well represented, although there are some notable absentees. Amongst the former Mr. Robert Crawshay, of Cyfarthfa Castle, contributes numerous examples, chiefly of views in South Wales, than which nothing could be finer. Another distinguished amateur, Colonel H. Stuart Wortley, is represented by several of his well-known studies of sea and sky, in which the light and shadow blend into each other with marvellous fidelity to nature. Mr. J. H. Mann's views in Tangiers and Gibraltar are bold and effective, as also are those of various places in Italy, by the Rev. W. A. Crofton Atkins. In portraiture there are many excellent examples. Those of Mr. A. Boucher, of Brighton, are very charming, especially his Rembrandtesques, which are "touched" with exquisite delicacy, and to great advantage. Messrs. R. Faulkner and Co. are represented by a frame of children taken instantaneously, and the *poses* are perfectly unrestrained and life-like. Messrs. Lombardi and Co., of Brighton, exhibit several high-class specimens of portraiture, cabinet and album; and Messrs. W. and H. Fry, also of Brighton, contribute some good work. Mr. Warwick Brooks, of Manchester, is represented by his unique "Academy portraits." Naturally the Autotype Company, of Rathbone Place, Oxford Street, who have done so much for photography by means of their carbon permanent enlargement process, are well represented. Their examples are always worth careful study, and in the present exhibition they are, as usual, of the highest class. The Woodbury Company, of Great Portland Street, exhibit some careful photographic reproductions of paintings and engravings. Mr. Warnerko sends several fine tissue negatives with prints from them; and on the table will be found lantern transparencies by Mr. F. York; photographic apparatus by Messrs. Oakley and Co.; and a revolving stereoscope containing pictures taken in India, Japan, and Java, by Mr. J. Boasley, jun. The exhibition will remain open till the 14th November.

(*Daily Telegraph.*)

On the walls and screens of the Water Colour Society's Gallery in Pall Mall are now arranged many hundreds of photographs fully and fairly exemplifying the present marvellously advanced, if not yet absolutely perfected, state of the heliographic art. If from the list of exhibitors a few absences of note have to be regretted, there is ample compensation in the excellence achieved by many of the seventy artists and amateurs who contribute this year to the Photographic Society's exhibition. Missing, as we do, any manifestations of the peculiar and characteristic skill of the president, Mr. Glaisher, and of such usually active vice-presidents and members of council as Mr. Valentine Blanchard, Professor Stokes, Dr. Diamond, Mr. Francis Bedford, and Jabez Hughes, we are the less inclined to lament the lack of specially scientific subjects—in which category, indeed, the present collection is wholly deficient—when we see so magnificent an array of portraiture as that which has been furnished by Messrs. Lombardi and Co., of Pall Mall and Brighton; the Woodbury and Autotype Companies, Mr. John Spiller, and other representatives of the highest artistic grade in photography. Colonel H. Stuart Wortley scarcely comes under the same class this year, his picturesque studies of heads and figures being in a minority as compared with his successful triumphs over the difficulties of light, shadow, and fluctuating motion in external nature.

Among the most important contributions are those of the firm at whose head stands Mr. Lombardi, and who, as the successors of Messrs. Caldesi and Company, worthily support the reputation of an establishment distinguished by its services in the dissemination of high art. Under the names of Lombardi and Company are no fewer than nineteen entries, chiefly relating to portraits of life-size, but also inclusive of cabinet and smaller specimens, in a Rembrandtesque style, many of which, grouped in one frame, are counted as a single contribution. In this manner the firm really exhibits a collection of likenesses numbering more nearly one hundred than a score; in addition to which there is a large photographic view of Northumberland House, taken shortly before its demolition by order of the Duke Northumberland. The most striking works of Mr Lombardi, however, are his life-size portraits, being carbon enlargements from photographs of remarkable vraisemblance. The head of the late Mr. Brassey, the engineer, finished in crayon; likenesses on porcelain of Mr. Gladstone, M.P., and other well-known personages; copies in carbon photography of portrait-paintings by Sandys and Buckner; direct photographs, pictorially treated; and three frames containing a remarkable series of small portraits, wonderful for the management of their chiaroscuro, make up the tale of Messrs. Lombardi and Co's specimens. The Autotype Company shows life-size portraits of the Queen, the Princess of Wales, Prince Albert Victor, Princess Louise Victoria, the Crown Prince and Princess of Germany, the Princess Frederika Karl, and Count von Moltke. Some of these and other likenesses, by the same exhibitors, are from negatives by Reichart and Lindner, of Berlin, and by W. and D. Downey, of London and Newcastle. But the most important work of the Autotype Company, photographically considered, is an artistic portrait of a lady, the negative being by Vogelsang, of Berlin, which will be seen on the same end-wall of the gallery with the likenesses of the Queen and Princess of Wales. The Woodbury Company is likewise prolific in portraiture, its most notable contributions, from negatives by Messrs. Lock and Whitfield, being heads of Cardinal Manning, Sir Garnet Wolseley, Lord Lytton, Lord Dufferin, Mr. Bright, Mr. Millais, Sir John Huddleston, and Sir Bartle Frere, some enlarged to the size of life, and others being unaltered reproductions from the series, "Men of Mark." Mr. Robert Crawshay, of Cyfarthfa Castle, one of the most indefatigable of amateurs, contributes some five-and-twenty out-door scenes, interesting as to their subjects, and admirable in all points of treatment. Captain Abney, besides having supplied the negatives of Eastern scenes, enlarged by the Woodbury Company, shows some excellent pictures on his own account, as well as in conjunction with the most skilful of his photographing staff in the Royal Engineers. There are in this exhibition a few favourable specimens of the Lambertype process—a very suggestive series of old and new homes in the Vale of Aylesbury, by Mr. S. G. Payne, showing that modern architecture can be picturesque as well as habitable when it tries: a sprinkling of pleasant landscape subjects by Mr. W. Bedford; a set of instantaneous portraits of children, catching the momentary expression with marvellous fidelity; a few charmingly perfect and delicate photographs, by M. F. Hollyer, from pictures by Mr. Val Prinsep, Mr. Pettie, R.A., and other painters; several very attractive works by Mr. A. Boucher; and, among the objects on the table in the centre of the gallery, a noteworthy series of lantern transparencies, by Mr. F. York.

DR. VOGEL.

A San Francisco journal gives a report of a meeting of photographers convened to give Dr. Vogel a welcome to the Pacific Coast. In responding to the remarks of the chairman, Dr. Vogel gave some details of his connection with photography. He said that he "confessed himself utterly astonished that he was there on the coast of the Pacific; but, asking himself the reason for coming there, the only answer was—photography. In his life he had studied a good many things, but generally not with much success. His father used to call him a lazy boy, and his mother used to say he was useful for nothing. For five years he was assistant in a grocery. At the age of twelve he made a camera obscura, and also an electrical machine—crude apparatus, which he still possesses. When he made the camera he had little anticipation that it would be the chief instrument of his future. (Applause.) At eighteen his father allowed him to study chemistry, and at the end of six years his studies were attended with good success. Chemistry is a wide field. It has many branches, and he asked himself which he had better follow. The conclusion he arrived at was that the best branch for him was that which gives light. Light was the first thing brought into the world with the creation; light we want now, in the present; light we want in the future; and it was his opinion that the science of light is the science of the universe. (Applause.) Very soon he was acquainted with photography, but how to study it and how to improve it was not an easy task. He had travelled in France and Germany, but at the outset of his career he had no expectation that his art would take him to Africa, to the East Indies, and thrice to America, he having six years ago attended the meeting in Cleveland of the National Photographic Association, and enjoyed there one of the happiest periods of his life. It had then been his pleasure to study photography in the Eastern States. Now, for the second time, he was in America, and had the opportunity to study the photography of the Pacific Coast. He was happy in saying that the position of the art here has such rank that we can compare favorably with the art in any other part of the world. Among the diploma takers at the Centennial would be found the names of artists in California, and it would be found that the photography of the Pacific Coast is held in high appreciation everywhere in Europe. The Professor concluded with some encomiums on the people, the climate, and soil of California."

PHOTOGRAPHY IN THE AMERICAN INTERNATIONAL EXHIBITION.

BY DR. H. VOGEL.*

[In the last number of our Philadelphia contemporary Dr. Vogel concludes his interesting notes on photography in the American Exhibition.]

The foreign countries are apparently not so much concerned in the Exhibition as America, the latter filling two-thirds of the hall. But my opinion is, that if all those foreign pictures hanging around in the Main Building and in Photographic Hall were brought together, the pictures from abroad would occupy more space than the American. We need only examine the grand exhibit of Goupil, and the many photographs from Australia, to be convinced that the foreign countries have made a larger display in the American than America ever has in any foreign Exhibition.

Of all the foreign countries France is the least represented, there being only two noteworthy exhibitors in the portrait branch—namely, Liebert and Walery, who are at present the leading photographers of Paris, and both are, it seems, foreigners. Liebert's pictures cause some interest on account of their execution in pigment (carbon); unfortunately, they hang in a very unfavourable place, and are printed too black, so that they will hardly be considered good specimens of the carbon process. Walery has shown some taste, and his pictures have a certain brilliancy; but exhibits of equal excellency are also made by many other photographers. Vidal's photo-chromos will hardly win the approbation of the American photographers. The portraits produce the impression on the mind of being ordinary paintings; the reproductions from artistic pieces seem to be better. Quite noticeable are the high-print zinc-plates which Gillot has produced by heliography. The landscapes by Bray, at Nizza, also show a tasteful artist.

Russia, at this Exhibition, takes a front rank, it being represented by its best photographers. A peculiarity with all its exhibitors is the prevailing style of executing half-length pictures on deep, dark backgrounds, which sometimes seem to be black. Large half-length pictures especially are nearly all made in this manner. This gives the figures a certain plasticity. Further, the eye is attracted by the many pictures half life-size taken direct; they are retouched with great delicacy in the positive, and may at the first glance deceive even the connoisseur. The quality of the productions of nearly all the Russian photographers is almost the same. Small card pictures are only exhibited by Bergamasco. Some peculiar pictures by Karlin, at Wischin, Noogorod, with large but not readable Russian description, deserve special notice, though I cannot praise everything he has exhibited. Karlin has, among others, taken some pictures in direct sunlight; they are rather an artificial work than a work of art; but he has been successful. One of these pictures is his own portrait, with a pencil in his hand, and another a Russian country girl in white chemise. The shadows are sufficiently exposed, but thereby the lights are not burned or over-exposed.

Karlin has success also in several of his groups. That there is such an artist in the far East, near the borders of Europe and Asia, should not be overlooked. Another Russian photographer, Jacovrsky, has taken his scenes from Algiers, and shows us some very interesting types of Algerian life.

Not far from the Russian display we find Bernaert Frères, of Brussels, who exhibit good carbon prints; and the few photographers from Norway and Sweden, among them Jaeger, of Stockholm, are distinguished by good reproductions.

Austria is represented by only a small number of photographers, and but two have exhibited in a large degree, namely, Baron von Stillfried, in Japan, who has delivered from Japan excellent genre pictures, and Joseph Ungar, the children's photographer. Luckhardt has sent excellent stereoscope pictures, and a series of fine cabinet pictures. Less attractive will be found the enlargement in the centre of the tableau, as in enlargements the Americans are ahead. The genre pictures of Ruprecht, at Oldenburg, exceed the limits of what photography can produce; but Schodisch's pictures of animals deserve attention; they are worthy to be placed side by side with Schreiber's pictures (Philadelphia).

V. Angerer, Vienna, has sent several good reproductions and interiors; but still more attractive are Larcajoli's excellent landscapes. Miss Bogner presents a speciality; he colours glass pictures with great effect, and not without taste.

Germany is represented by thirty exhibitors, and among them are the best names. In the foremost rank we place Loescher and Petsch, Berlin. Many young and able photographers have endeavoured to compete with them, but they are not as yet overtaken. On the contrary, they have established a school—a style—in Germany, to which we observe belong many other exhibitors, as Reichardt and Lindner, of Berlin, and Schulz and Suck, of Carlsruhe. Unfortunately, Loescher and Petsch's pictures are not hanging in a very favourable place, and suffer by glass reflex. Several of the pictures—especially the costume pictures taken at the masquerade festivals of the Crown Prince—are excellent on account of their positions, fine selection of backgrounds, decoration, and distribution of light and shade.

Different from the style of Loescher and Petsch, are those of Mieschewsky, at Dantzig, and Kiewning and Schaarwächter, at Berlin, the works of the latter being remarkable for a certain *air noblesse*, and their very delicate

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[*] Concluded from page 398.

modulation. In the decoration of his tableaux he proceeds like Walery; even the tableaux are similar. The pictures are put on dark-brown velvet or plush, so that they lie deep. In Walery's we find the large pictures above and ranged along in a row; the smaller ones are put in rows under them. More taste is shown in the arrangement of Schaarwächter's, who has encircled six large pictures with small ones. Besides that, the colour of the backgrounds and the pictures of the latter harmonize better than they do in Walery's pictures, which have a cold appearance from the brown tone of the velvet. These points deserve attention, for the effect depends considerably on the arrangement of the pictures. My opinion is that Loescher and Petsch's pictures would appear to a great deal better advantage on dark ground than on the gray *carton* upon which they are pasted.

Trapp and Munch have made a colossal show; they have sent specimens of their albumen paper in the form of pictures from nearly all the photographers in the world. Their manufacture fully merits the recognition which it has already received in America.

More modestly, however, appears another exhibitor, viz., Busch, from Rathenow. He exhibits several of his excellent portrait lenses, with specimens of pictures by Schaarwächter. Busch's lenses acquired a great reputation in Europe. In capacity for work they are not inferior to any of the other firms, and they should readily find friends in America, especially as their prices are not at all high. Rückwardt's architectures, as well as Schaarwächter's portraits, show the excellence of Busch's lenses far better than mere words could do.

Germany is represented by two landscape photographers, one of whom is a most excellent one; that is Scholz, of Gorlitz. I might assert that after Jenning's landscapes (Dublin) those of Scholz deserve the most attention.

Every one knows what great attention the "Lichtdruck" process, or Albertype, received in Germany. It is also fully represented at the Exhibition. Albert has sent several of his best photographs: also, Obernetter and Jacobi. Their way to success was paved by Browning and Meyer, at Mentz. They have succeeded in applying the steam-power press, and are able to deliver 1,500 impressions off one plate. A part of the German exhibits in "Lichtdruck" is placed in the Main Building; for instance, Strumper, at Hamburg, and Römler and Jonas, of Dresden.

I have still something to add in favour of "Lichtdruck." Other countries have so far given this process very little attention; but the time is not far distant when it will be generally introduced. For with the portrait branch it is of no importance, but for art publishers it is most valuable.

Geldmacher has sent several specimens of pigment-print, which are transferred on porcelain, glass, wood, linen, &c. They show what can be done in that branch.

I understand that they have introduced it again in America, with all the latest improvements, giving it, however, another name, and calling it chromotypy, which is nothing more than the carbon-printing process improved by Johnson and Sawyer.

I have already described this simple process in my letters at the beginning of this year. There now remains not the least secret in regard to it. I will remark, also, that there is no difficulty at all in the performing of the operation in cool weather, as there is in warm, as then the sensitized gelatine easily melts down. If the air is damp it dries very slowly, and decomposes before it is dry. These are the two obstacles; they, however, can be overcome. We may hasten the drying process by quick drafts of air, and at high temperature we may lay the sheets horizontally, in order to prevent the gelatine from running down.

For the production of large imperishable pictures, as well as window pictures, this process is most valuable.

Canada, in all its exhibits, is leaning more to America than to England. The similarity in all its proportions can be noticed very easily. Here and there are prevailing life-size pictures, which have received more or less changes by retouch; and we also notice here the same highly cultivated photographic routine. Ahead of all stands Notman. I am not satisfied with the painting in several pictures executed in oil. The groups in the skating rinks show skill, but what most attracted me was the smaller pictures, especially the handsome groups of hunters and skaters. In these Notman shows the man of inventive genius and taste.

Henderson is distinguished in the landscape branch, and approaches therein more to England. The latter takes in this department without dispute the supremacy. At the London Exhibition, in 1862, the Englishmen were already ahead of all other exhibitors in landscape photography, and to the present time they have retained this high position. It is difficult to select among so many excellent things the best; but in the Photographic Hall we do not hesitate a moment to award the palm to Mr. Payne Jennings, of Dublin. He exhibits nine prints, 8 by 10, all in one frame, which, indeed, leave all others far behind on account of the fine selection of subjects, tender gradation of tone, finishing of clouds, and fine effects of light.

If permitted, I would here make some objections to the American landscapes, especially in regard to those of the Yosemite Valley. Very often too little attention is given to the effect of the foreground, though nothing else has a greater influence. If the foreground is too large it will intrude on the background, which perhaps may be the most important part, and in consequence it appears small and insignificant. Nearly all the Englishmen have calculated on the effect of the foreground. The excellency of English landscapes does not solely depend on a certain technic, but in the study of the landscape itself, in finding out the best point for taking, the best moments for sensitizing, the right time of exposure, and certainly the careful preparation of the negative.

The landscapes of Robinson are also very fine and harmonizing; his shore pictures are really little masterpieces. Likewise in forest landscapes he gives some excellent work of clouds. Stuart Wortley, the well-known dry-plate man, has also worked in shore pictures with success. The specimens of his urano-dry plates deserve the most attention. Vernon Heath's landscapes are attractive from the advantageous size; they are enlargements in carbon from small negatives. It is astonishing how little they lost thereby in sharpness and fine gradation of tone. Carbon enlargements have certainly a future.

Besides Heath, there is W. Bedford, in England, working in excellent landscapes, after Fr. Bedford. W. England and Frank Good have sent many creditable things, but they do not rank among the best. Hudson (Ventnor) merits acknowledgment.

In relation to the portrait branch, England occupies a peculiar position. It gives specimens of keen experiments, which, however, do not entirely satisfy. Life-size heads, taken direct by Crawshay and Wortley, are bold pieces of work, but they leave the beholder unmoved. Our lenses do not perform everything, and our sitters do not keep still as long as is required for taking such large heads. Mrs. Cameron shows in her studies, which remind us vividly of the pictures of the old masters, eminent artistic taste, but here and there the technic leaves something to be desired. The remainder of portraits sent from England is of average good work—not more! Worthy of mention are the burnt-in pictures by Henderson, in London, and the animal pictures by York, Lancaster. It is queer that the former is not more represented at the exhibition. Till the present time all trials to introduce generally burnt-in pictures for use as decorations on emaille, porcelain, &c., have been without success.

In conclusion, I mention one expositor whose pictures have remained for months in the cellar of the exhibition building, entirely forgotten until lately, when they have been brought to daylight; that is J. Levy, of Paris, who has sent numerous excellent transparencies and lantern slides, which certainly can be counted as the best things in the French department at the Exhibition, and the best of their kind anywhere.

A TRIP TO THE HEBRIDES.

BY REUBEN MITCHELL.*

We had been looking out several days for an opportunity of seeing Scuir-na-Gillian clear from clouds and mist; a favourable morning at last gave us an opportunity of securing two views from the banks of a second burn, smaller but very rugged and picturesque, making an excellent foreground for the grand old mountain. We were well repaid for our trouble in scrambling, with the willing assistance of our Highlanders, to get our instruments up to so high an elevation, through heather and bog, and over rocks, for our views turned out very satisfactory; so returning to the hotel, I decided to go to Currey-na-Criech, about four and a-half miles distant. Mr. Butters having provided me with two ponies for the journey, one for carrying my boxes with my instruments, and fastened pannier fashion on the saddle, I mounted the other and started off somewhat uncertain of success under such peculiar circumstances, though I had two Highlanders as assistants. Our path was by the side of the burn, something like a sheep track of the wildest description, over rocks, stones, bog, and streams, but a more charming trip on a fine day can hardly be imagined. As before described, the burn is most picturesque, but the further we ascended the more wild it became. Several cascades leap over the ledges of rock into pools below at a considerable depth, some rather unpleasantly near the track; but by this time complete confidence was established between me and my pony, which threaded its way through the most rugged paths ever traversed without making one false step; it had evidently been the same path before. All I had to do was to allow it to have the bridle slack, so that it could have free use of its head to see and pick out its course, which it did without making any mistake, and landed me safely on the top of the mountain, my assistants and the pack pony following close in the rear. It is worthy of remarking the changes in the forms of the crags of Scuir-na-Gillian in passing over the vale into the Curry. At one point they appear separated with five peaks of a saw-tooth form, which adds much to their wild appearance. In coming in sight of Curry-na-Criech, I was awe struck—a deep glen, and rising out of the bottom a growth of frowning gloomy mountains, a part of the Cuchutlins, the clouds clinging relentlessly to the peaks. I soon found I had come too late in the day, but we descended about half a mile down the side of the glen. I filled my camera, but the wind at times blew in such strong gusts it was with difficulty we could keep the camera and ourselves from being blown down, so I was obliged to give it up and beat a retreat, but promising to return and make a day of it the first favourable opportunity, we packed, and my assistants placed the boxes on the pony as before. I started some time before them, and I had considerable amusement with a young foal that had accompanied us there and back. In returning it galloped about, and kicked up its heels right merrily, but before we arrived at the hotel it had lost all galloping freaks, and walked quietly in the rear. The return journey put the capabilities of the pony to a severe test; it is much easier to ascend than to descend, with safety. I kept my seat all the way, though at times the descent was at an angle of 45°, but the pony landed me safely at the hotel, without any mishap. After satisfying the cravings of hunger, I was anxious to see the results of my excursion, so I at once developed the two plates, and found them better than I expected from the strong gust of wind the camera had been exposed to. It made me more anxious to secure several other views from different points of these most extraordinary mountains. We had several broken days, partially wet and fine, and little could be done. I sketched at intervals when fine; my young friend amused himself with fishing in the burn, and caught several fine trout.

I had made up my mind to start early the first favourable morning for my second trip to Curry-na-Criech. After waiting several days it appeared likely to be fine, and all being arranged and ponies got ready, I started once more to visit my favourite mountains and glen. I had arranged to have the ponies taken into the bottom of the glen, a most difficult task, caused by large quantities of loose stone constantly chipping off and rolling down the mountain sides, also numbers of small streamlets and bogs, with the steep incline, made it very trying to the patient ponies. The descent being accomplished in safety, the ponies were hobbled and turned loose to browse. Just as the camera was fixed a pelting shower of rain came on, which, fortunately, only lasted for a short time, or we should have been soon deluged. As the rain passed over, the sun shone out beautifully, and continued fine the rest of the day, which enabled me to get four excellent negatives. During arranging my views I had made up my mind to try and ascend to what appeared a flat table rock, at no very great elevation. I pointed the spot out to my guide, and asked him if he thought the distance would be a mile, but he said he thought it would not be so much. It only proves how deceitful is distance up mountains, even to natives. I started from the place, and noticed the time. I scrambled over rocks and loose stones, and found I had attempted a most difficult task. Coming to the verge of a deep ravine, it was impossible to pass, and to ascend any further was also impossible without some assistance; it had taken me thirty-five minutes to get to this spot, and it appeared only about half way to where I had set out to reach. On returning, I observed that a very large mass of rock on one side of the pass was detached, and had removed, apparently, about a foot from its original bed. No doubt this ponderous mass will sometime come down with a crash, and add more to the wild confusion of loose stones and boulders in thousands of tons already strewn in heaps upon heaps. Such a scene of silent grandeur is a fit abode for the soaring eagles which are at times to be seen here. Having completed my exposures, I put up my instruments, my guide saddled the pony, and, packed as before, we started our ascent out of this gloomy glen, leading our ponies over a most difficult ascent; but we got safe to the top, and arrived at the hotel about eight o'clock p.m., very well satisfied with the day's work. After dinner, I could not rest till I had developed my four plates, all of which were as fine as I could wish.

(To be continued.)

A Novel Kaleidoscope.—An improved form of kaleidoscope, by M. Thomas, of Paris, has been reported on favourably by the Société d'Encouragement. The two mirrors are, as usual, placed in a tube, but the objects employed to produce the images are inclosed in a transparent case which is separate from the tube. This case, almost flat, and with its two faces formed of watch glasses, is supported by a rod which is fixed to the tube by a hinge; it can also receive a movement of rotation round its axis of suspension. In this way it can be inclined in any direction to the axis of the tube. A button manipulated with the hand enables one to turn it about its centre, so as to change the positions of the objects within. A pasteboard disc, white on one side, black on the other, is placed behind the case. Transparent or opaque objects may thus receive light on one or the other side of the case, and be detached on the white or black background of the disc, according as it may be desired to observe them by transmission or by reflection. M. Thomas has obtained much more beautiful effects by this new method, and of infinite variety. The instrument is recommended to artists, designers, and others.—*English Mechanic.*

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* Continued from page 442.

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PHOTOGRAPHY AND MEDICINE.

At this time of year, just before the autumn and winter sessions at universities and colleges begin, a large number of circulars are issued to parents and guardians setting forth particulars relating to these institutions. Young men who have matriculated and are about to commence their studies at college usually enter upon the curriculum at this time, especially if they are preparing for the medical profession, and hence it is that this period is chosen for putting forth the academical programme.

We have received a large number of these circulars on the present occasion, and have glanced with some interest through the many courses of instruction set down, to ascertain whether any notice whatever is taken of photography in the studies for medical aspirants. We are sorry to see that an art so useful and interesting is almost completely ignored, and despite the many applications of photography of late years to the science of medicine, there seem to be no facilities offered to students who desire to learn something regarding the camera and its capabilities. Indeed, as we have several times pointed out in these columns, instruction in photography is nowhere so disregarded at schools and colleges as in this country. In Belgium so much importance is attached to the subject that a very fine photographic laboratory for instructional purposes has been established there by Government, under the able auspices of Professor Rommelaere, whose name as an ardent photographic investigator is well known in this country. At Brussels the most perfect photographic tuition may be obtained, for not only are the principles of the art taught to students, but they are instructed also in all its more recent developments.

In Paris, again, M. Davanne's classes have attained such prominence that that gentleman has been recently induced to put his lectures into print, in order that they may afford more extensive instruction still for those French students who are debarred from visiting the capital and attending the professor's own classes. At Berlin, as our readers know, Professor Hermann Vogel occupies a chair of photography at the Royal Industrial College; while at Vienna, Dr. Hornig, the president of the Vienna Photographic Society, is the acknowledged Government lecturer upon the art-science. So that in every other capital there seems to be far more attention paid to instruction in photography than in our own.

We have said that of late years some very useful applications of photography to medical science have been made, and we are sure that many of these are still fresh in the memory of many readers. The use made of our art as a register of the pulse action is a good example of what we mean. As most medical men—and men of science generally, for that matter—are altogether ignorant of photography and its capabilities, they are unfortunately unable to make use of any aid that may be derived from the process, and we have on several occasions heard of photographers being called in to assist a physician in some simple experiment, by reason of the latter having not the least idea of the properties of a sensitive plate. The wonderful work performed by Dr. Luys, Dr. Ozanam, Dr. Wright, and others, shows what may be done by medical investigators if they only have a knowledge of how the camera can help them. The pulse investigations of Dr. Luys are profoundly interesting. Indeed, he makes photography give a perfect record of the vitality of his patient, and at the recent Photographic Exhibition in Paris a whole series of such "pulse" curves were shown. Among other results, he showed the difference in the vitality of a boy five years old, and that of a man in the prime of life. The boy's pulse, beating eighty to the minute, was depicted in the shape of a series of sharp zigzags, the image taking the form of a sharp serrated saw; the pulse of a man in the prime of life, on the other hand, beat only fifty-five to the minute, but the beats were more marked, and the record was a series of sharply-pointed spires, double the height of the zigzags given by the boy's pulse. Again, Dr. Luys has shown us what the pulse of a man a hundred years old is like. The sharp-pointed spires have fallen down woefully, and we have but a series of undulating curves, suggesting that his strength is passing "over the hills and far away."

The throbbing of the heart has been in the same way registered by means of photography by Dr. Ozanam, and other investigators have occupied themselves with researches on the brain and upon skin diseases by the aid of the camera. The anatomist and physiologist have also of late years made use of the camera in securing microscopic pictures of their specimens, and in relation to the constitution of the eye and the ear the camera has frequently received application.

Seeing, therefore, the great aid that photography is able to furnish to the man of science, and especially to the physician and surgeon, we cannot help expressing surprise that our high schools and colleges should not recognise the art in some way, and impart to students who desire it a knowledge of the manipulations and processes of which they may one day stand sorely in need.

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THE PHOTOGRAPHIC EXHIBITION.

Before proceeding further to notice the contents of the exhibition, we may as well briefly dispose here of the subjects of some letters we have received respecting some of the arrangements. Primarily, much umbrage seems to be taken by some in consequence of a charge having this year been made to members for the number of the journal containing the catalogue. In former years, members of the society received the exhibition number of the journal free, as they received all other numbers. This year a charge of threepence has been made to members of the society and to the public alike. One correspondent, whose letter we cannot print, notwithstanding that he "claims its publication, uncurtailed, as a right," speaks of being "defrauded" by this charge. He remarks that when he became a member of the society, it issued twelve journals every year. It has since then curtailed the numbers to eight, and when an extraordinary issue takes place in the form of a catalogue, making the number still only nine instead of twelve, he is made to pay for a copy. Another correspondent complains that although he would willingly have paid for a catalogue rather than waste his visit by looking at a number of pictures without any names thereon, he saw no one in the room of whom to purchase a catalogue. A country member writes, that being unable to attend the ordinary meetings, the journals are all he receives for his guinea.

He thinks it therefore singularly shortsighted policy, for the sake of gaining a few pence, to risk offending many members. On this point, at least, we are agreed with our correspondent. The object is doubtless the laudable one of preventing the exhibition, if possible, from being a charge on the funds of the society, endeavouring to make it, in fact, self-supporting, which, if we remember aright, last year it failed to be. But we certainly agree with our correspondent in questioning the policy of the step. The sum is trivial in the extreme, and not worth much discussion; but as the catalogue appears as a number of the journal, every member naturally feels that he is entitled to it as heretofore. As the present exhibition has fewer contributions, fewer contributors, and opened, at least, with fewer visitors, we regret that any trivial circumstance of this kind should have the slightest retarding or depressing influence. The annual exhibitions of the society have, we believe, been of incalculable value to photography. They afforded the valuable influence of teaching by example and the stimulus of emulation to photographers, and they have done much to elevate the status of photography in the eyes of the public. Hence we should most earnestly deprecate anything which may in any way militate against their continuance and success.

In many respects the hanging of the pictures has been unusually well managed this year. It is open to the objection, which has on some occasions been taken on the part of exhibitors, that their contributions are scattered instead of being hung all together; but considerations of an individual character must be ever subsidiary to the general effect. Here the ensemble is very good; and the attempt, not absolutely rigidly carried out, at classification, materially contributes to convenience. Commencing at number one, for instance, and proceeding onward, the whole of the first wall is devoted to landscape contributions. Referring to landscape photographs in the American exhibition, Dr. Vogel remarks that England takes, without dispute, precedency of all other countries. And in the present exhibition we find many contributions which tread absolutely on the verge of perfection. The one objection, which a fastidious critic might make, is to the effect that there is almost too much of a dead level of excellence. There are, it is true, some contributors who are many steps in advance of the ruck; but there are no surprises such as were afforded some years ago by the magnificently large and rarely pictorial landscapes of Earl, and the embodied poetry of Robinson's large instantaneous subjects, in which the rapid portrayal of breaking waves, setting suns, and flocks of sheep, were only incidents in a fine pictorial composition, not the sole *raison d'etre* of the picture.

Nearest in character to those we have just mentioned are the large instantaneous pictures of Col. Stuart Wortley, which are not only surprisingly fine renderings technically of cloud and sea effect, but possess many good pictorial qualities. Possibly the one objection which might be taken is that arising out of the technical difficulties of securing in such large pictures full exposure sufficiently rapidly; hence, in some cases, there is a little heaviness and solidity in place of light and atmosphere. It is possible that somewhat lighter printing might to some extent remedy this. In No. 26, "Desolate," the grim sombreness of the scene—the majestic desolation—is, perhaps, helped by the gloom of slight under-exposure. But the grand masses of "Clouds" (No. 14) might have a more vaporous and floating effect. Possibly the rich, brilliant, warm toned print slightly interferes with unsubstantial atmospheric effect generally seen in even the heaviest clouds. Possibly the same may be said of No. 24, "Morning," a fine pictorial study of cloud and sea, with an admirably placed figure of pony and rider. A greyer tone and lighter print would have given this picture more truly the feeling of morning. Ruskin tells us that the clouds of early dawn are "colder and more quiet than a windless sea under the moon of midnight," and describes them gradually whitening until they are iridescent with morning light. In "Swirling Water" (241) Col. Wortley has been very successful.

Mr. Crawshay is an extensive contributor of landscapes this year. He has hitherto been best known to photographers as holding very high rank amongst amateur photographers of portrait and figure subjects. He has sent fine landscapes to the last two exhibitions, but this year he has chiefly or entirely devoted himself to landscape work, and at once takes position with the ablest photographers in this department. The whole of the five-and twenty contributions sent this year are perfect as examples of technical photography, and the majority of them admirable in an artistic sense. Full of poetry, and singularly characteristic in their rendering of the poetry of nature, are some of the scenes here. A view of the Little Taff, or Taff Vechan, at Cyfarthfa (No. 20), is a most charming picture. The swirling and rushing water, tumbling from ledge to ledge of the picturesque rock, the whole embosomed in charming foliage, is perfectly rendered. The broken foaming torrent is not a mass of cotton wool, but clear, sparkling, moving, troubled water, whilst the deepest shadow in the rocks, and every detail of foliage, are perfectly rendered. "Broully's Castle" (No. 94), and "Llangorse Lake" (No. 269), finely illustrate the artistic feeling of the photographer. The desolate quiet of "Penydawn Iron Works," with a sad pathos, illustrate the effect of the strike amongst iron workers. The smokeless chimneys, the motionless machinery, the unused waggons, the absence of all kinds of life, only too suggestively tell the tale of folly and wickedness which has paralysed one of the chief sources of the nation's wealth and prosperity. Besides a great variety of fine landscapes, Mr. Crawshay has sent some fine views of Caerphilly Castle and its leaning tower, some very interesting views of a country "show," with its band on the platform, clown, and gaudy paintings, and around it the wondering crowd of rustics who have not yet made up their minds to go inside. A capital picture of "Washing Sheep" (No. 39) is also well worthy of examination. A specially distinguishing quality of all Mr. Crawshay's work is a singular softness combined with richness, and the presence of space and atmosphere. There is nothing hard, patchy, or spotty, and nothing flat or feeble; but a prevailing harmony which always satisfies the eye.

Mr. William Bedford suggests the highest type of professional landscape photographer. The uniformity of size adopted, the uniformity of style in the work, in the tone and general treatment, forbid the notion that there is anything of amateur experimentalizing in style or effect. Each picture, at first glance, seems like a very fine engraving in tone, in definition, and general perfection of finish. His views of Tintern Abbey are very admirable, and the river view at Ludlow is very charming. In 223 ("A Weeping Willow") and 287 ("An Old Farmhouse") Mr. Bedford has, however, given us something out of his usual style, something very fine and picturesque, apparently enlargements; but the catalogue is without information on the subject. We wait for further details.

The landscapes are so interesting that we have already exhausted the legitimate space we can devote, and have only commenced to notice them. We must return to them in our next.

A NATIONAL TRAINING SCHOOL OF PHOTOGRAPHY.

BY GEORGE CECIL HANCE.

No. 2.

In my first paper I omitted the word "Training" in the designation of such an establishment, but on reflection I think that, with its addition, neither the profession nor the public will be led astray as to the nature of such an institution. As my readers are doubtless aware, there are several photographic studios in the metropolis and elsewhere, the proprietors of which style them "Schools of Photography," and therefore it would entirely prevent any one from confounding the National Training School with any establishment styling itself the "Berlin School of Photography," &c.

Having endeavoured to show in my last contribution how a training school for young photographers might be formed, I will in this try to point out the advantages such an institution would produce, and the great disadvantages we are at present under from not being possessed of one.

Firstly. How many photographers are there at the present time who have any knowledge at all of the anatomy of the human form? I believe very few. Yet if the art education of a painter or sculptor is not considered efficient unless he can pass a certain rather stiff examination in anatomy, I can scarcely see why a photographic operator's education should be entirely devoid of it. "But," says some one, "a photographer does not draw in the figure as a painter does; the camera and lens do all that." Very true, my friend; but how is it possible for a photographer to correct any distortion, or unseemly wrinkles in a face, by means of retouching, when he knows absolutely nothing about the conformation of that face? And if he employ a professional retoucher to do the work, how can he know if it is rightly done or not? Again, another says, "But a photographer never makes nude studies, like a painter or a sculptor, so that I can see but little benefit arising from being acquainted with anatomy." Stop, my good sir; but are you aware that the fashionable portrait painter of the day, if he has been (and he is almost sure to have been) a student of the Royal Academy, has to pass the same examination in anatomy as the figure painter does? And as a photographer is continually engaged in producing portraits, he ought to know something of facial anatomy at the very least, and in a training school this would undoubtedly be taught.

Secondly. "Honour to whom honour is due." My reason for quoting that motto is this: that at the present time it frequently happens that a man devoid of any education, either general photographic or art, but yet possessed of some money, opens a photographic gallery, and the work is executed by persons in his employ, and the proprietor, while reaping all the credit for the excellence of the work produced, styles himself an "artist." (Heaven save the mark!) But how can he possibly be one, when he knows but a little, if anything at all, about the business? Such a man's real position, commercially, is about the same as a picture dealer's, but with this distinction, that the latter never arrogates to himself the credit of having produced the different pictures he has for sale, whereas the photographer always, or nearly so, does. I can cite numerous instances where such a state of things exists, and the sooner they are done away with the better for photography. We must remember that every gentleman who has a photographic studio calls himself an artist, and also a professional man, and therefore, such being the case, let him conduct himself as a bonâ fide one, and let those who execute the work be rewarded with the honour due unto them. With a National Training School we should see an important revolution in this respect, for, depend upon it, that if there were medals (gold, silver, and bronze) given away yearly to the most successful students belonging to the training school, the photographer who was so far fortunate as to become the employer of the gold medallist of the year would not long allow either his brethren or the public to remain in utter ignorance of the fact.

A FEW NOTES UPON CARBON PRINTING.

BY E. F. ROLLS, A.S.I.E.

The many who have admired the truly pleasant effect attained by toning the margin round an oval or other shape will have equally deplored the high prices charged for the different frames advertised to ensure correct register, and the cumbrous and extravagant manipulation they entail.

When I started double printing in carbon, I made up my mind that I could not afford one of these machines, so set about trying what I could do without. I succeeded at once, and the results were so good that I came to the conclusion that everybody else must be working in the same way, and that the elaborate frames were simply fanciful knick-knacks for Dilettanti. But speaking to a professional the other day, I found him morose upon the prices of the frames, and surprised that "I could do the work with my fingers." So, perhaps, the way may be of use to some of your readers. It seems long in description, but is quick enough and easy enough in practice.

To begin with, I put the oval on the negative, and the tissue on that, in an ordinary silver printing frame, and print: and as an instance of how easy it is to print with a simple actinometer, my little boy of five watches the tints, and shifts the paper the number of times agreed upon, and I am rarely much out, even with maiden negatives.

After the print is sufficiently exposed, I take it into a room where I have a table and chair comfortably arranged at a window, its yellow blind pulled down. Sitting down at the table, I place the frame upon it, its face downwards; open the right hand end or flap, then place my right hand fingers firmly on the pad, open the left hand flap, put the shutter on one side, and place my left hand upon its end of the pad, then my right hand fingers on the tissue, and the thumb on the under-side of the oval. I now let go with my left, and holding tissue and oval firmly together in my right, I turn my wrist and bring oval paper and tissue on their backs on the table. I then place my left hand on the opposite end of the oval, and thereby liberate my right, with which I place the disc exactly in the oval aperture. Having it in place and my left-hand fingers transferred to it, I release the oval paper, slip it up my left-hand fingers, until I can replace them with my right hand introduced beneath the oval paper. Now it remains to remove the right hand without disturbing the disc; and here only did I meet with any difficulty at first, because the light disc was apt to adhere to the fingers; but one or two small weights put on with the left hand, before letting go with the right, made all plain sailing. The blind is now pulled up, and the margin printed the desired tint, and upon developing the match is found to be perfect.

If it is desired to print in a border and name from a gelatine sheet, it can easily be done by cutting the tissue to a size marked on the gelatine outside of the border; and the placing of the gelatine sheet, and removal of the weights to its corners, follows so naturally upon what has been done, that description is unnecessary, and all is in a few seconds ready for the collodionized plate and subsequent

Developing.

Experience has taught me that for this the water can not be used too little heated: what is commonly called the chill off, say 90°, is ample; more patience is called for, as with warmer water the plates must not remain unmoved more than a minute or two, because of myriad bubbles of expanded air accumulating upon them; but the results are better, and the light tints can be made more delicate without danger of chalkiness—no small gain in this process, which is rather handicapped in that respect.

The developing effected, the transparency, *well* alumed and rinsed, is best left to dry. I know it is recommended by some to attach the softened transfer paper at once, but this method is apt to result in great loss of beauty by the coarse grain apparent in the picture when dry, and which is apparently caused by unequal drying of the tissue and paper.

As to soaking the transfer paper, although it adheres firmly enough after treatment with cold water, water at 100° produces a far softer bed for the print to lie in, and warm water is therefore to be preferred. In my working I keep a few half gallon bottles filled with extremely weak solutions of Judson's dyes; and when I am not satisfied with the tone of the tissue upon white transfer, I soak the transfer paper (previously softened in warm water) in one of these solutions, and as it is the nature of these dyes to accumulate in the substance exposed to their action, the depth of colour is controlled by the time of immersion, so that a scale of tones is attainable with each solution. And this plan will be found to have many advantages over the ordinary one of tinting the collodion, tissue, or developed print while on the glass. One has no capital locked up in bottles of tinted collodion—only a few pence for the dyes; and a print is never spoilt by mistaken judgment in selecting the tone, because its effect can be judged (through the glass) directly the paper is attached, and if unsatisfactory, the paper can be taken off again.

There is still another application of coloured paper which has a charming effect with some views: I refer to the beautiful sky-tinted and delicately-graduated papers sold at the artist's warehouse. One of these, of a suitable size, judiciously attached to the carbon transparency, by first covering that transparency with a layer of warm gelatine, results in a very charming picture, which is rendered still more striking if the dried transparency has previously had its foliage, &c., suitably coloured with powder applied broadly with a stump. With comparatively little trouble quite a little work of art is produced.

One more remark upon the paper, and I have done. If the Autotype Company would supply a double transfer paper coated at the back with an insoluble film, such as india-rubber, much trouble would be saved to those who risk their prints to retain the glassy surface, as the glue water would not penetrate to the face of the print, even if mounted after removal from its glass, and to mount in that manner is by far the most convenient.

THE HYGEINIC EFFECTS OF CHROMIC SALTS ON PHOTOGRAPHERS.

BY DR. LIESEGANG.*

As the chromate salts are rapidly growing in inportance in photographic practice, in pigment printing, enamel printing, Lichtdruck, photo-lithography, &c., it is only natural that the attention of scientific men should be given to its noxious properties. Photographic societies, as well as medical men, have of late repeatedly occupied themselves with the subject, and for this reason I do not apologise for introducing to my readers a few remarks upon the effect of such salts on the health of those who have to do with them.

The chomates are, from a general standpoint, of high toxicological interest, by reason of the energy of their inward and outward action, bringing forward all the symptoms of an irritant poison; moreover, some observers speak of their active working upon the nerve system and the lungs.

Taken inwardly, the chromates give rise to inflammation of the stomach and kidneys; the brilliant yellow colour of the vomit and purging, which set in very rapidly, being highly characteristic. The result of a case of poisoning is death in five to twelve hours. A fatal dose is exceedingly small, that of the dichromate (double-chromate salt) being about the same as of arsenic salts and corrosive sublimate. The normal chromates (simple chromate salt) are much less energetic poisons, and for this reason it is that treatment in cases of poisoning with dichromate usually consists in the ministration of such bodies as magnesia, lime-water, carbonate of lime, &c, to produce the simple chromate.

In the manuals and journals touching upon poisoning, there are few cases to be met with relating to the chromates; poisoning cases of this description have been mostly due to inadvertence, as, for instance, in sucking up dichromate solution through a tube, during which a portion entered the mouth of the operator; or in eating a slice of bread and butter which had been put on one side, and so become covered with dichromate dust. Cases of suicide by means of the chromates are comparatively rare.

In all cases of inward poisoning there is inflammation and partial corrosion the skin of the mouth, throat, and stomach, while a painful cramp is felt in the region of the stomach. As soon as the poison gets into the blood, respiration is considerably retarded, the hands and feet become cold, and if the dose has been a large one, dropsy supervenes, while death follows very shortly. As antidote in such a case it is well to administer, as rapidly as possible, any of the bodies above enumerated, which have a neutralising effect, as well as milk and albumen. This should be done even before the arrival of the doctor. In the case of the extremities becoming cold, every effort should be made to restore their warmth by enegetically rubbing them with alcohol to which five per cent. of ammonia has been added.

The chromates have also an external energetic action; upon a healthy skin they do not fail to act, while in the case of a wound they may do a great deal of mischief. Irrespective of the circumstance that many individuals, from working a long time with dichromate solution, especially of a warm nature, as in the case of sensitizing pigmented tissue, get their fingers stiffened by such work, those who are of a sensitive nature are subject to shooting pains and considerable tenderness of the hands, even when their hands are quite whole and the skin not torn in the least. The prolonged action of dichromate solution brings about the discharge of matter and the formation of pustules, especially if the hands happen to be chapped or the cuticle in any way broken. Such pustules, too, have a tendency to spread very much in a radiating manner, and are very obstinate of removal, as the author of this communication knows to his cost.

Such symptoms are to be found in factories in which the manufacture of the dichromate of potash is carried on. The dust which is given off in clearing out the crystallization vessels, in packing, and in other manipulations, get into the air, and thus impede respiration, producing inflammation of the mouth, and also occasionally ulcers, as well as obstinate catarrh. The prolonged action of the dust in the nostrils has the effect of eating away the diaphragm between them.

In photographic studios such things as these are not to be feared with ordinary care, for one has to do merely with dilute solutions, and these, if manipulated with caution, should not have any injurious influence. In any case, it is to be recommended that operators who have any sores on hand or arm should not occupy themselves with chromate solutions; they should wait until all such wounds are healed. The contact of chromates in the form of dust or solution with tender parts of the skin—as, for instance, those in the mouth, nose, and eyes—must be most carefully avoided. The greatest degree of cleanliness is therefore to be insisted upon, and especially the washing of the hands in plenty of water after they have been dipped into chromate solution, before the latter has had time to dry upon the skin. In the same way, a thorough sluicing of the face, eyes, and nose is advisable, so that any dust may be at once removed.

All other precautions that are recommended—such as the coating of fingers with a solution of paraffin in ether, or with a thin film of collodion and castor oil, or the putting on of finger stalls while floating the paper on the bath, or the lifting of the paper by means of wedges, as also the application of the chromate solution by means of a brush—all to a certain extent impede work without actually rendering the operator altogether free from impunity. Care and cleanliness are two principal qualities which the photographer should possess in the highest degree, and are the best preservers against the injurious action of the chromates.

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* *Photographisches Archiv.*

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THE CARBON PROCESS.

Dr. Paul Liesegang, the well-known photographic chemist and editor of the *Photographic Archiv*, has just issued a handbook upon printing in pigments under the title of *Der Kohle Druck*. It is, beyond everything, a practical manual, and will, we have not the least doubt, be found particularly useful to those who occupy themselves with this method of printing in Germany.

Der Kohle Druck commences with a succinct resumé of the history of carbon printing :—"The first observation of the photographic properties of dichromate of potash, which plays the principal rôle in our process, dates from the year 1838, when the English chemist, Mungo Pouton, discovered that a sheet of writing-paper impregnated with this salt became browned in sunlight ; when put under an engraving and submitted to the action of the sun's rays, a negative impression was the result." This, as Dr. Liesegang points out, was the germ of printing in permanent pigments, and then follow the steps of progress made by Becquerel, Fox Talbot, Poitevin, Pouncy, Laborde, Fargier, Swan, Johnson, and others. It is impossible, of course, within the limits of a dozen pages, to do full justice to all who have contributed towards the production of perfect carbon prints ; at the same time, we should have been pleased to have seen the name of M. Marion among the pioneers in the art, his process of Mariotype, which was brought to the notice of photographers three or four years ago, being an exceedingly practical and original method of printing.

Dr. Liesegang describes the method of preparing the pigmented tissue, as also that of producing the transfer papers, and then proceeds to the practical manipulation of the same in sensitizing, printing, and developing. With these our readers are tolerably familiar, and we need not, therefore, allude to them at any length. The production of carbon pictures on a collodion surface is also minutely explained, and the best methods of retouching and finishing the prints. Carbon prints, as Dr. Liesegang tells us, may be applied to almost every surface. We extract from his book some remarks upon the transfer of prints to alba plates, wood, canvas, &c :—

"Instead of applying the carbon print to paper, it may be transferred to any material having a coating of gelatine.

"A beautiful carbon print transferred to an alba plate has an exceedingly fine appearance. The alba plates are varnished metal plates, with a lustreless coating of delicate white ; they are usually employed in the production of collodio-chloride pictures. They may be covered with collodion in the same way as glass, and the carbon print upon this surface, but in this case the print is reversed. To secure the picture in its true sense, it must be first of all developed upon a provisional support, and after drying transferred to the alba plate, which, however, is first of all covered with gelatine. A two per cent. solution of gelatine is suitable for the purpose, and this is mixed shortly before employment with a little chrome alum solution, taking care to stir the liquid in the meantime. Twenty grammes of gelatine may be dissolved in 400 grammes of water for the purpose, and to this one gramme of chrome alum, dissolved in 20 grammes of water, is added. The developed carbon print is put into cold water with the gelatined alba plate ; the two surfaces are brought together, and then taken out and dried. The transport paper may then be removed, and the picture remains upon the alba plate.

"In the same way pictures developed upon transport paper may be transferred to linen, opal glass, porcelain, and other surfaces, by the aid of gelatine solution.

"If it is desired to put the picture at once upon cardboard or into an album, you proceed in the following manner :—The still moist picture is allowed to float upon a solution of gelatine (1 part gelatine to 5 parts water), kept warm by means of a water-bath, and is then hung up to dry. After this the picture is dipped into a strong solution of sugar and again dried. In the meantime, that place where the picture is to go is gelatined by the aid of a brush, and the spot also allowed to dry. The print, still adherent to the transport paper, is trimmed and moistened in water, and at the same time the place where it is to go is also wetted ; the picture is then put down, care being taken to prevent air-bubbles, and subjected to slight pressure. On drying, the transport paper falls off of itself, and the picture remains cemented down in its proper position.

"In transferring prints to wood so that they may serve for wood blocks, it is necessary that the pictures should be reversed, so that in printing the image appears in its proper sense. For this reason we may develop the picture direct upon wood, and need not, as in the case of silver printing, to employ reversed negatives. So that as little of the gelatinous matter comes upon the wood as possible (for this obstructs the work of the cutter), a tissue should be employed containing a large amount of pigment. The wood is coated with gelatine in the same way as before, and then allowed to dry. The exposed tissue is put in cold water and applied to the wood block, which is also wetted, and afterwards the image is developed direct upon the wood. The picture is finally washed in cold water, and dried without artificial warmth.

"To produce prints upon drawing-paper so that they can be finished with chalk or water colour, the image is developed in the ordinary way upon transport paper, and then transferred to the drawing-paper, which has been previously coated with gelatine solution.

"Forty grammes of gelatine are dissolved in four hundred grammes of water by the aid of heat, and then one gramme of chrome alum is dissolved in twenty grammes of warm water and mixed with the former, agitating the whole. The sheet of drawing-paper is nailed at the corners upon a stretching board, and covered uniformly with the solutions by the aid of a brush ; after drying, a second application is made.

"The drawing paper is then put into warm water of 34° Reaumur, and the picture upon the transport paper is put into cold water. When the gelatine film has become soft, the drawing-paper is also brought into the cold water, and both surfaces being brought into contact, they are withdrawn from the bath, pressed together, and allowed to dry. The transport paper leaves as soon as the image adheres to the drawing paper ; the latter may have a rough or smooth surface.

"To transfer carbon prints to canvas for the purpose of being coloured in oil, it is necessary that they should adhere so firmly that no separation is afterwards possible. Ordinary painter's canvas is taken and stretched upon a board ; it is folded round the margin of the board, and made fast. The surface is rubbed by means of a hard brush dipped into soda lye until all the fibres have been removed ; enough of the preparation is, however, allowed to remain to fill up the interstices between the threads. After washing and drying, the canvas is evenly coated three times with gelatine solution of the same nature as that just described, the canvas being allowed to dry after every application. The print upon the transport paper is not allowed to dry, but is applied wet to the canvas, which had previously been moistened with cold water ; the two surfaces are pressed together, allowed to dry, and then the paper backing is peeled off."

Dr. Liesegang further proceeds to discuss the production of carbon prints upon glass and mica, such as are suitable for light screens, windows, stereoscopic slides, and the magic lantern, and gives some useful information regarding the colouring and retouching of these.

Finally, he gives a resumé of the defects most frequently met with in carbon printing, and the manner of overcoming these. This chapter we propose to lay before our readers on a future occasion.

Correspondence

THE CATALOGUE OF THE EXHIBITION.

Sir,—I am a country member of the Photographic Society, and for this reason do not care to come to town for the exhibition unless I am tolerably sure that it is worth looking at. I read your brief notice of the pictures in last week's News, and am eagerly looking for further descriptions, both in the columns of the photographic journals, and in those of the London press, in order to learn something more definite of the names of exhibitors, and the extent to which certain of them contribute. I should have known all this long ago had I received a copy of the Society's Journal containing the catalogue, but this has never reached me; and on complaining of the circumstance to a brother member, he tells me the catalogue is an extraordinary number of the Journal, and for this reason is not supplied to members free. May I ask if this is the case? for as I am unable to attend the Society's meetings in town, the only return I get for my guinea subscription is the Society's Journal, which certainly is not "extraordinary." I cannot help thinking it is very short-sighted policy on the part of the Society, for only a few pence can be gained by such a transaction, while it will greatly displease members generally, and especially those who live in the country.—Faithfully yours, M. P. S.

[We cannot explain the circumstance. In former years all members received without charge, and as a matter of right, the number of the Journal containing the catalogue of the exhibition. This year it is not so, for what reason we know not. Every one requiring the catalogue number of the Journal must purchase it. Our correspondent is not less fortunate than his fellow-members. We made application for the number, as we have done on former years, and were required to pay threepence as the condition of receiving it. See some remarks in our notice of the exhibition.—Ed.] *

THE PHOTOGRAPHIC EXHIBITION.

Dear Sir,—I should very much like to know why on earth the exhibition of the Photographic Society is this year held some two months earlier than usual, and at a time when everybody who is anybody is out of town, and all the country photographers are busiest, and in a majority of cases neither master nor man will be able to leave home to see it? Is it a matter of the utmost indifference to the council whether the art is advanced, and the exhibition to be patronized, so long as fifty gentlemen can be found in swallow tails at the opening service? The question seems to me pertinent.—I remain yours truly, R. H. P.

THE EDINBURGH PHOTOGRAPHIC SOCIETY.

Sir,—Absolute indifference as to anything Mr. Neilson—of whose existence even, though a resident of Edinburgh for more than ten years, I had not even heard until I saw him at the meeting of July 3rd—might have to say in reply to my letter, is the only explanation I can give of the fact that I never, until the end of last week, saw his answer to it. If I notice it now, it is merely to give an emphatic denial to the statement, as unwarrantable as it is impertinent, that I was "manipulated" by anyone.

Ignorance of the differences existing in the Society by no means involves ignorance of what was going on on the one subject of giving medals, as to which, having heard all Mr. Neilson and his following had to advance, I was quite as competent to judge as himself. I imputed no motives to him or his friends other than those given by themselves. They have no reason to assign for excluding resident photographers, save "the jealousy and ill-will" sure to arise. Unless, therefore, they claim for themselves superiority to such paltry feelings over other members of the Society, jealousy of their fellows gaining prizes I hold to be fairly deducible as their motive.

The sneer—for I maintain it was a sneer—regarding the "well-drilled majority" may be excused in one smarting under defeat, and the knowledge that he had no majority to drill. That no means were left untried by him to carry his point is amply proved by what occurred at the beginning of the meeting. Fearing the example set at the one previous, of electing a member to get his vote the same evening, might be followed, intimation was given in writing to the chairman (I understood by Mr. Neilson; at all events, the slip was handed by him) that any member proposed for election that evening would be blackballed. The indignation this very extraordinary and unfair proceeding aroused, naturally led to a good deal of the warmth and plain speaking which followed, and of which there was quite as much on the one side as the other; but it is simply untrue to say there was "hooting and howling whenever any of the opposite party arose to speak, and repeating the same in chorus." Reckless assertion and vulgar abuse are not argument, Mr. Neilson may rest assured. His other remarks, which I shall not condescend to notice, infinitely divert, but do not hurt me Especially have I been amused at his sneering description of the twenty-five members, who declined to be dictated to by him, as "a very small party bent on introducing medals at all hazards and by all means."

As I really have not the time—if I could find the patience—to bestow further notice on Mr. Neilson, I shall now leave your readers to form their own conclusions.—I remain, yours &c., A. Williamson.

Talk in the Studio.

New Test Colours.—A correspondent of the *Scientific American*, speaking of the colours of flowers for testing alkalies and acids, says:—"I have found the blue convolvulus major, or morning glory, of considerable practical value as a test for acids and alkalies. In the first place, the flower itself is very sensitive, indicating the trace of nitric acid in rain water after a thunderstorm. The flowers show red spots wherever the rain water has wetted the surface after a shower during the night. A few of the flowers rubbed in a glass of water will give a bright blue liquid, which will instantly redden if a drop of nitric or other acid be put in; and the blue will be restored by neutralization. But if the alkali is much in excess, it will turn green, and return to blue on neutralizing again. Water coloured by the red convolvulus will turn blue on the addition of an alkaline salt, but is not so sensitive as the blue."

Comparative Photographs of Blood.—The *American Naturalist* states that Dr. J. G. Richardson, for the sake of illustrating in criminal cases the distinguishable appearances of different kinds of blood, has flowed drops of blood from different animals so nearly in contact on the glass slide that portions of the two drops appear in the same field, and can be photographed together. Dr. C. Leo Mees has modified this method, and obtained exquisite results in specimens presented to the microscopical section of the Tyndall Association. He spreads the blood by Dr. Christopher Johnston's method, which is to touch a drop of blood to the accurately ground edge of a slide, and then draw it gently across the face of another slide, leaving a beautifully spread film. In this way one kind of blood is spread upon the slide, and another on the cover. When dry, one half of each is carefully scraped off with a smoothly sharpened knife, and the cover inverted upon the slide in such position as to bring the remaining portions of the film into apposition. Under the microscope and in the photograph the two kinds of blood appear in remarkably fine contrast, even those bloods that are too nearly alike for safe discrimination in criminal cases being easily distinguished when thus prepared from fresh material.

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* Since these lines were in type we have received a copy by post.—Ed.

New Applications of Salicylic Acid.—It has been determined that the addition of from 0·0005 to 0·001 part of salicylic acid to cistern water clarifies the same in a remarkable manner, and that water which ordinarily, in the space of a month, would become foul and unfit to drink, remains perfectly pure and limpid. This property of the acid will doubtless be found of great value on board vessels making long voyages, as it has been determined that scurvy is often produced by the deterioration of water through too long sojourn in casks and tanks. The combination of salicylic acid with calcareous salts has also been noted by M. Berger to be so intimate, that water thus charged and treated may be evaporated, even to dryness, without any lime deposit being formed. The acid is therefore one of the best (if not the best) preventives of steam boiler scale and incrustation; but until some cheaper way of producing it than now is practised is discovered it can scarcely come into general use for this purpose.—*Scientific American.*

To Correspondents.

A Constant Reader.—It is possible to take a good ferrotype portrait by artificial light; but difficult, of course, to secure a distribution of light and shade as perfect as in daylight. 2. The best and most easily managed artificial light for portraiture is the magnesium light, burnt in a lamp expressly prepared to secure the greatest control over it. 3. The magnesium lamp ribbon, and all appliances for working, may be had of Mr. Solomon, Red Lion Square, Holborn, from whom also you may obtain all information and details of expense.

Exhibition.—The Photographic Exhibition is open every day; but in the evenings only of Monday and Saturday. 2. We prefer No. 2 in your list as beyond a question most trustworthy.

An Amateur.—We have not heard of any such results on the addition of nitrate of baryta to the bath. You have added more than is necessary, and possibly excess may have a detrimental effect. The action of the baryta salt in the bath is by no means well understood; the theory of its action is not clear, all that is known being the general fact that it prevents pinholes. What its result in excess may be is not yet known. When it was first proposed by Dr. Vogel as a cure for pinholes it was on the assumption that the pinholes in question arose from the presence of sulphate of silver in the bath; but it cannot be supposed that sulphate of silver is present in every case where it now acts as a cure for pinholes. You may reduce the proportion of the baryta salt either by adding an equal bulk of plain silver solution, or by adding a few drops of sulphuric acid, and so getting rid of the baryta by throwing it down as a sulphate, and then filtering it out.

A. C. Smith.—Your proportions as translated are near enough to the original for all practical purposes. As we have never tried the formula in question, we cannot speak with certainty of its value. We have, however, tried tartaric acid in the developer, and do not like its working. We have generally found it give a cold grey tone and a thin image, through which light readily passed. We prefer acetic acid. (b.) Bichloride of mercury is used in a variety of ways in intensifying. It is most conveniently worked in somewhat weak solution, say of from five to ten grains per ounce of water. If such a solution be applied to a negative, and allowed to remain until a uniform grey tone appear on the surface, the image will be found to have acquired a slight additional intensity without further treatment. If still more intensity be required, the application of a one-grain solution of iodide of potassium to the mercurialized surface will give it an olive tint very non-actinic. If, instead of the iodide, a weak solution of ammonium or hyposulphite of potassium be applied, a black image will be obtained. Or if, after applying the iodide solution, still greater intensity be required, silver and pyro applied will give a very dense negative. There are other modes of applying mercury for the same purpose, which you will find mentioned in our various Year-Books. (c.) We have in former volumes of the News described all photographic chemicals and their uses. If you will mention any individual substances on the uses of which in photography you wish for information, we shall be happy to help you; but we cannot, with justice to subscribers possessing the back volumes, reprint the whole. (d.) The evil you mention is annoying, but we hope not common. It is necessary that the cells in dark slides should be a fraction larger than the full size of the plate; but if you purchase commercial dry plates which are so much too small that they drop through the dark slide, you should have them made good.

H. V., on the same subject, asks if satisfactory reasons exist for holding the Exhibition so much earlier than usual this year, as it is probably to that circumstance the falling off in the number of contributors and of visitors is partly due. We believe that the time is governed by the time at which the Water Colour Gallery could be obtained.

An Aggrieved Member.—We think you have undoubted cause for annoyance, but we cannot insert your angry letter. We do not admit the claim of any correspondent to the use of our columns "as a right." The only claims we admit are based on the character of the communications themselves: they must be interesting and courteous. When you speak of the Society "defrauding you of threepence" you use discourteous terms. And when you suppose that our own connection with the council will lead us to justify the charge for the catalogue journal, you suppose what is really not true, and express it without due courtesy. We regret the charge, and we do not know who is answerable for the step. You will find on another page we express our regret without hesitation. We don't know that you have any remedy.

R. H., writing also in relation to the Exhibition, challenges our remarks in last week's issue to the effect that the attendance at the opening soiree was scanty; and contrasts it with the report of a contemporary to the effect that the attendance was "unusually large." The discrepancy between the two statements is not one for us to discuss; but we may give the precise number, and leave our readers to form their own conclusions. The total number present was one hundred and twelve, and of these upwards of fifty were not in the evening dress indicated on the admission ticket. On some former occasions the attendance had been nearer to five hundred than one hundred.

W. Hart.—We do not remember whether any lantern slides in illustration of Shakesperian subjects are in existence or not. Mr. F. York, 87, Lancaster Road, Notting Hill, is one of the largest publishers of lantern slides, and will, probably, on application, furnish you with the information.

H. F. H.—The central spot of which you complain generally arises from some defect in the mounting of the lens, and, possibly, may be remedied by the maker. In using a single combination, placing the stop nearer to the lens will often effect an improvement. The central spot is often aggravated by a strong light from the sky reaching the lens, and the use of a shade in such case effects an improvement.

A Constant Reader (No. II.)—The best mode of using the sciopticon for enlarging purposes is to produce from a transparency an enlarged negative, using the sciopticon to enlarge the image, and producing the negative by the ordinary wet process.

G. B.—We have described the working of collodion transfer enlargements several times, both in the News and various Year-Books, where you will find fuller details than we can give here. All the instructions which have appeared in back volumes and in past Year-Books on producing Sarony's photographic crayon enlargements will be found useful. Our Year-Books for 1870 and 1871 will be found useful. Your mode of proceeding will be to produce a fine enlarged transparency, using a ripe collodion and pyro developer, taking care not to develop too far. Tone with gold. When the collodion print is completed and washed, take the gelatinized paper (Autotype transfer paper will serve), and having wet it all over by immersion in water, and placed it on the film about a quarter of an inch from the top and one side of the film, turn over these edges on the paper; use a squeegee to press the paper and film into perfect contact, and remove air-bubbles; lift both up, and dry under a weight. If you wish for a glazed surface, you leave the paper in contact with the negative until it is dry, and then peel it off. Some practice is necessary to master the manipulations. A tough collodion is also necessary. A little citric acid in the final washing water of the film tends to loosen it from the glass.

H. F. H.—It is possible your silver solution is unusually strong after treatment. The use of a very strong iron solution will tend to remedy the defect; or longer immersion of the plate in the bath may be found remedial; or the use of a newer collodion. We know of nothing really trustworthy, more conducive to quick working for taking children, than bath and collodion in good condition, an iron developer containing fifty grains of the iron salt and twenty minims of acetic acid in an ounce of water at a temperature not lower than 60° Fah., a good lens, and large stop. Preliminary exposure of the plate to white light of course accelerates.

H. Turner.—Either actual testing in the camera, or the guarantee of a trustworthy optician, is your only safeguard. B we prefer. You may rely on a good instrument.

Harry A. H. Daniel.—We are glad to hear of the renewed effort of the Bristol Society. Let us hear of your success.

T. P.—The date of the Technical Exhibition will be fixed as soon as the Society meets, we presume. The first meeting is on the evening of the second Thursday in October.

T. Rolls.—The paper is very interesting. Many thanks.

G. Nesbitt.—Thanks. We will write.

P. Piquepe.—Thanks.

T. Donovon.—Thanks for explanatory note. We will give due attention.

Several Correspondents in our next.

A National School of Photography (Errata in No. 1).—Line 44, column 2, page 441, for "*of* the Royal" read "*and* the Royal"; same page, column 1, line 7, for "in *communion* with" read "in *common* with."

The Photographic News, September 29, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Position of Photographers from Different Points of View.—The status of a photographer, like that of a painter, depends upon his individual capacity. The producer of the village sign-boards, and the President of the Royal Academy, are both painters, but they enjoy different ranks. So it is with photographers. No man can claim a special status simply because he is a photographer; he will take his position by the value of his works, as a painter does. It is, we know, often asserted that there is no art in photography at all, and, for that reason, it is absurd to talk of photographers taking rank as artists. But this point is very easily dealt with. "Have those gentlemen who are known to fame as the producers of pictorial photographs any claim whatever to be considered artists?" is the first question. We answer at once that they have, and, if you like, in a connection quite outside photography. We are but little acquainted with the personal qualifications of most of our leading photographers, but we know, at any rate, quite enough to prove our case. We will take, by way of example, three photographers from three European countries, England, France, and Germany. We could quote more instances if we chose, but those are quite sufficient for our purpose. We select from each of these countries the name of one capable photographer from the many that could be chosen, and these we will regard as representative men for our purpose. They shall be Adam-Salomon, of Paris; Hanns Hartmann, of Berlin; and H. P. Robinson, of Tunbridge Wells. M. Hartmann is the right hand of the firm of Loescher and Petsch, of Berlin, whose charming group and portrait studies are as well known almost in this country as abroad, while the other two names we quote are so familiar that we should have to apologise if we gave further particulars about them. Now, have those gentlemen the right to style themselves artists, or have they not? M. Adam-Salomon, besides being so successful as a photographer, is a sculptor of standing, whose works in stone and marble are well known; he would, therefore, be a rash man who would be disposed to dispute M. Adam-Salomon's knowledge of art, and, if his photographs show no impulse of the artist, there is only one theory possible, viz., that he has wilfully suppressed his art capacity when executing them. Only if this can be believed, can one suppose that art does not enter into his photography. In any case it cannot be denied that if sculptors are artists, M. Adam-Salomon, the photographer, must be an artist also. Mr. H. P. Robinson, quite apart from his photographic work, has a claim to be considered an artist as a painter; that is to say, he has painted pictures which the Hanging Committee of the Royal Academy long pronounced worthy to be hung in their galleries, while it is rare now-a-days that one or other of the London collections does not contain a picture from his brush. If he is not an artist, then half those gentlemen who exhibit at the Royal Academy have no claim to that title either. Does he, too, suppress all his artistic talent when he takes a photograph? Of M. Hartmann precisely the same may be said, for as a painter of landscapes and as a scenic artist at the theatres his name is widely known. Is it his art knowledge that permits him to compose those charming group photographs for which he is famous, or does he act by rule of thumb as soon as he exchanges the palette for the camera, the result being more of a "fluke" than anything else? If the magnificent photographs are simply "flukes," which the mechanical camera sometimes produces and sometimes does not, all we can say is that our leading photographers are a very fortunate set of men, for their good-luck in this respect is surprising. To speak seriously, however, a photographer's standing is governed by the work he does, and, unfortunately for him, until he does make a position of his own, he is regarded as among the most ordinary of mortals. Times will change, no doubt, but photography, thanks to the vile productions that are perpetrated every day around us, occupies a very low place in the public mind. That everybody can turn his hand to photography is the popular idea, when he has tried everything else, and failed; and the consequence is that photography as a profession is not looked up to. A most striking instance of the disregard of a photographer's capabilities has, indeed, just been shown by our army authorities. As our readers may know, a Royal Warrant has recently been issued "to revise the regulations under which pensions are granted to non-commissioned officers and men of our army," and this warrant, although not generally interesting to photographers, deserves a passing notice in these columns, as we shall presently show. If our army were simply made up of sergeants, corporals, and privates, as most people suppose, the issue of new regulations would be a very simple matter; but this is not the case. There are a large number of different kinds of sergeants, a few of each rank only, and this minority receive three or four times as much consideration as the simple non-commissioned officers and men in the Line regiments. Thus these are armourer sergeants, farrier sergeants, sergeants of gymnastics, and also sergeant photographers. Consequently, as many as six different classes have been formed with a different rate of pensions, and these classes from No. I. to VI. form a sort of table of precedence among non-commissioned officers and men of the army. Class I. contains the élite of the non-commissioned officers, the master-gunner, the sergeant-major, first-class staff sergeants, &c.; Class II. quarter-master-sergeants, sergeants of gymnastics, &c.; in Class III. we find the sergeant photographer, together with other junior staff sergeants; Class IV. includes the ordinary Line sergeants and colour-sergeants, the band sergeant, and bugle sergeant; in Class V. we come to the corporals and bombardiers, and in Class VI. appears a long list of those who rank in the lowest grade: gunner, driver, private, sapper, musician, kettle-drummer, so it goes down, post bugler, fifer and piper, post signalman, messenger, and school orderly, until we arrive at the very bottom of this lowest class, and there we find last of all "Gunner Assistant Photographer." He, then, is considered by the Horse Guards as the humblest of all non-commissioned officers and men in Her Majesty's service, and his pension, we are told, after he has served twenty-one years, will amount to the munificent sum of eight-pence a day, or, if he has the good fortune to hold good conduct stripes, he gets one penny more for every such stripe. We do not know exactly what amount of technical knowledge a "Gunner Assistant Photographer" is supposed to possess; but still, if he know how to filter a silver bath and clean a glass plate properly, we should deem his rank quite equal to that of a common soldier. His superior is evidently the Sergeant Photographer, in Class III. We presume that he is a properly trained photographer, capable of operating and printing, also of conducting the whole photographic work connected with an army; and if this is the case, we consider Class III. rather low for his abilities. If he produce well-lighted photographs, and understand the various processes put forward from time to time so as to avail himself of their aid in making progress, we think he might consider himself perfectly entitled to rank with any non-commissioned officer in the service. However, as we understand very little of military affairs, we do not wish to go very deep into the rights and wrongs of the subject; but we could not resist the temptation of furnishing our readers with an example of how photographic abilities are sometimes estimated. It is in the hands of photographers themselves to acquire a position—unless, perhaps, they are under martial law—and that position can only be won individually by personal exertion.

FRENCH CORRESPONDENCE.

The Late Thomas Sutton—The Ills Photography is heir to—M. Quiquerez on Developers—The Decomposition of Bicarbonate of Soda—Medicine and Photography—Photographic Instruction in Schools and Colleges.

In a letter which he has recently written to us, M. Silvy, a photographer well-known in London some years ago, gives some interesting particulars regarding the late Mr. Thomas Sutton. He was, our correspondent says "one of the most energetic men I ever knew, and at the same time one of the most persevering in investigations. His health, there cannot be a doubt, was undermined by his laboratory work, the inspiration of ether vapour having caused him, as it has done me, to be subjected to fits of deafness, followed with lethargic sleep. It was to get over this illness that his physician counselled him in 1867 to take to boating and navigation for a time. For this reason he purchased his yacht "The Rover," and went off with his wife and son to the Mediterranean, where he experienced such soothing effect that he resolved to live on dry land only during the winter. Whether he maintained this resolve or not I cannot say, but in the month of October in the same year, when I went to see him at Redon, in Brittany, I found him installed like a veritable Robinson Crusoe, with his yacht stranded on the quay before his house, and its equipment stored in an out-building which he had rented for the purpose."

It was under similar circumstances that we ourselves had the pleasure of seeing him when in 1873 we journeyed to Redon on a visit. As to M. Silvy, our correspondent, he still suffers in health from what he has undergone while he practised photography in London, and it was from a curing establishment at Eurard that his letter is dated. Examples of sickness caused by photography are, unfortunately, too rife among us, and one cannot too strongly recommend prudence in carrying on the manipulations connected with the art.

In reference to the discussions which have recently been raised on the subject of developers, M. Quiquerez, whose useful communications I have recently had occasion to quote in these columns, has written to me that he shares the opinion expressed by M. Waldack. Like the latter, he believes that the more concentrated the developer is, the less exposure is necessary, and the more soft will be the image. But he thinks that a strong developer is only good in the case of portraiture, or in the production of coloured objects illuminated by diffused light. In regard to landscape work, he has never found anything better than the iron and copper formula which he has already published, and which has appeared in the Photographic News. With this developer a rather long exposure is necessary, it is true, but the results are exceedingly beautiful. When sufficiently exposed, there is no need for intensifying the cliché. M. Quiquerez attributes to his employment of this developer the fineness which his negatives possess, these being, as we ourselves know, exceptionally beautiful.

So far as landscape work is concerned, this skilful amateur thinks that the whole secret of success lies in employing a weak developer, and having recourse to a long exposure. As to the alkaline developer, M. Quiquerez believes it to be good for commencing the operation of development of dry plates, especially those which have been prepared with tannin, and those in which the preservative is mixed with gallic or pyrogallic acid. So far as these latter are concerned, they must not, according to M. Quiquerez, be washed before being plunged into the alkaline bath.

After long experience, M. Quiquerez thinks that the coffee process, and that of albumen with pyrogallic acid, are the best dry methods for all purposes. He proposes very shortly to employ some plates which have been prepared now for more than a year, and these, he believes, will be found to have lost none of their good qualities. We shall have much pleasure in communicating to the readers of the Photographic News the result of these interesting trials as soon as they have been made known to us.

We find in a note addressed to the Academy of Science, by M Urbain, upon the decomposition of bicarbonate of soda heated to 100° C., some observations which deserve to be noticed, for the salt is one which is applied in photography, and has a place in many formulæ for development. When a current of air is passed into a heated flask containing an alkaline bicarbonate in *vacuo*, the decomposition of the salt takes place very perfectly and rapidly. It is the same when the salt is in a damp condition, or, in a solution, is warmed in the open air, the aqueous vapour which is disengaged carrying off the carbonic acid as it is produced. The decomposition may be carried out, also, but with much less rapidity, when the undried bicarbonate of soda is warmed in an open vessel—in a capsule, for instance. In this case there occurs an elimination of carbonic acid in the air currents which pass around the heated vessel. The decomposition of bicarbonate of soda would be impossible, it must be borne in mind, if the compound were encrusted in a substance which forms a varnish around it, as in the case of the salt being heated in a vessel from which the air has been withdrawn. Albumen realises perfectly the conditions required for a cement to seal up the bicarbonate. A little gum, or even sugar, added to albumen, is desirable, and this, when added to the bicarbonate of soda after it has been dried at the ordinary temperature, prevents the salt from undergoing further change under ordinary circumstances.

I see by an article published the other day in the Photographic News, under the title of "Photography and Medicine," the conclusions of which will earn general approbation, that photographic instruction is undertaken less in England than in France. With us there is not only M. Davanne, who is a lecturer upon photography at the *School des Ponts et Chaussees*, where he gives his practical demonstrations; but at the Central School of Arts and Manufactures, a special professor of photography has been appointed for some time past in the person of our esteemed friend M. Franck de Villecholle. The same gentleman instructs the cadets in the Military Academy at Saint Cyr in photographic manipulations. The School of Military Engineers and Naval School, as also the *Ecole Polytechnique*, have also their instructors in the art. I believe, also, that in the staff college, instruction in photography is also given. Before long, it is certain that we shall have instruction of the same kind introduced into art schools and colleges, for we are beginning to learn and appreciate the aid that the camera can lend in pursuing scientific studies and investigations. There does not pass a meeting of the Academy of Sciences at which photographic records of one kind or another are not submitted in support of some communications, whether in respect to geology, the mechanics, astronomy, navigation, medicine, natural history, &c. Photographs are the indispensable illustrations of memoirs now-a-days in every branch of science. But in most cases the authors, albeit scientific men of high attainments, are obliged to have recourse to the assistance of professional photographers, more or less skilful as operators, but without any knowledge or even sympathy with the work they are required to illustrate. Could the authors themselves only do the work themselves, they would obtain many advantages which they do not otherwise realise. It is a great stride of progress, therefore, that photography is now taught in our high schools, and it is surprising that England, which, as a rule, is so practical and so prompt to seize upon things truly useful, should be behind us in such a matter.

Ernest Lacan.

CARBON ENLARGEMENTS BY ARTIFICIAL LIGHT.

BY DR. LIESEGANG.*

In the year 1872 I described, in the *Archiv*, the manner of producing enlargements by means of the pigment process. It there reads: "For producing large impressions from small negatives the pigment process offers several advantages. First, the impressions are durable, which, considering the fixed prices for enlargements, is not to be despised or considered trifling; then the preparation of a proper diapositive can by no other method be done more readily and better than by this process; and, lastly, the results of this method are finer than by any other process can possibly be produced. Besides, there is to be reckoned the circumstance that for this process every good printing negative can be used; it is neither necessary to be taken on plate-glass, nor to contain any other character than a common negative for albumen print, if it only answers the main condition, being entirely sharp "In the usual manner we can also prepare by the negative a positive glass picture when we rub the pigment paper after moistening the same with a caoutchouc rubber on a cleaned glass plate, and develop the picture with warm water. By this diapositive we can prepare in the copying camera the enlarged collodion negative which is to be multiplicated by the pigment process."

In the first number of the volume for 1874 I have drawn attention to the application of petroleum light for such enlargements; and in July, 1874, I gave a complete description of the Paris Lambertype, which, in reality, is nothing else than the before-described process.

This process, as has been the case with many other good ones, has remained unnoticed till last year, when from Paris were echoed sounds of praise in Germany, and beautiful enlargements attracted attention. Experiences gained in the course of the winter in the application of artificial light, and the fact that the process is already adopted in many establishments with the best success, has induced me to describe the same again particularly, though in France and England it is still treated, being protected by patent, and patent combinations, as a secret. I do not assert, however, that the Messrs. Frenchmen, proceed precisely in the same manner as I am describing it. I think it is necessary to premise these remarks in order to prevent reclamations, which often enough occur when my articles make the round in foreign periodicals.

1. *The Pigment Diapositive.*—The diapositive used for enlargements must be entirely different from a transparent glass picture required for windows, lamp-shades, and other purposes. Instead of a strong. plastic diapositive of an agreeable, in the deepest shades, entirely untransparent colour, we must aim to produce a thin, tender picture, pervious to light in all its parts. But such picture can by no means be produced with the black pigment-paper prepared for transparent and stereoscope pictures, which contains much colour, but requires some of good distributed colour; the best would be paper prepared with carmine, Venetian red, and a little boneblack. The preparation in the chrom. bath is done in the same manner as in the common pigment process; the paper having been taken out of the bath, is laid with its gelatine side on a good, cleaned plate glass, covered with a caoutchouc cloth, and rolled over with the squeezer. After that it is left five minutes on the plate after which it is taken off and hung up for drying. The exposure under the negative, which is secured with a safety-margin of white paper, has generally to last half as long again as the time required for a paper picture.

The exposed pigment paper is to be moistened in the usual manner, laid on a good, cleaned, faultless plate of glass, and fastened by means of the squeezer. The glass plate is not to be rubbed over with wax; but it may be coated previously with thin, structure-free, raw collodion, and laid in water till the fatty stripes disappear. After that the damp pigment-paper is to be laid on, and developed in the usual manner.

It has been noticed that generally sure results are secured when the glass plates are coated with gelatine instead of collodion. The netlike appearance of the picture face, which sometimes occurs on bare or collodionized glass (which is affected by the temperature in which the pigment-paper is produced, as also by the application of certain kinds of gelatine) is never produced. In consequence of the importance which certainly is to be attached to the good condition of the diapositive for the success of the enlargement—for with it every fault will be enlarged also—every one will willingly make use of gelatinizing the glass plate when this cracked appearance occurs in the least degree. For this purpose the plate is at first to be cleaned thoroughly and dusted off. The gelatine solution is to be prepared, after G. Willis, in the following manner: put 26 grammes Nelson's gelatine in 800 grammes cold water; after an hour's time place the vessel in hot water. The gelatine is dissolved therein. Besides this, 1 gramme chrom. alum is to be dissolved in 160 grammes hot water, and this solution to be poured gradually into the gelatine while stirring the same. This is to be filtered through fine muslin, and the glass plates are to be coated with the liquid while it is yet warm, and with a clean glass-staff it can be touched up, as if collodion was poured on. For drying, it must be placed on a place free from dust. This work can be done a long time in advance, and the plates should be kept in boxes with marked backs. After the picture has been developed, the glass plate must be dipped in cold water; a minute afterwards the exposed pigment paper put in. Before it straightens out again we lay it on the plate, take both out of the water, squeeze, let it stand five to ten minutes, and then develop.

When we wish to produce very fine and sharp impressions we have to proceed, after Monckhoven, in another manner. The desideratum is to give the pigment a very smooth surface. We have to put on a carefully clean plate glass, a little larger than the pigment-paper to be sensitized, a coat of very clear raw collodion, and let it stand some hours on a place free of dust. The plate is not to be waxed nor dipped in water.

The pigment-paper we put in the chrom. bath; lay it then with the gelatine side on the layer of collodion; cover it with the caoutchouc cloth, and squeeze out the liquid. Then let it dry on the glass plate. The paper will keep good on the plate for use during a week; if we have several such plates we put them on each other, so that the air cannot operate on the back of the paper. In putting on the paper we have to avoid air-bubbles as much as possible, for as soon as the paper sticks on it we cannot take it off again without spoiling the coating of collodion.

Drying takes, in moderate temperature, three to four hours.

Before using, we cut off on the plate from the paper as much as necessary, and leave the remainder on the plate. The paper has now a very smooth surface, and sticks straight to the negative; it must, therefore, deliver much better and sharper impressions than the freely-dried scarred pigment-paper. We expose in the usual manner, and before the development lay the paper in water in which is put a little muriatic acid (about 1 to 1000). In this it must remain longer than usual; the gelatine must be nearly soaked through by the water, or the layer will easily get a netlike appearance. We lay the paper on a very clean and faultless glass plate (without a coat of collodion or wax), and squeeze it on without laying caoutchouc cloth between. It is better to avoid air-bubbles entirely, instead of trying to remove them afterwards by squeezing. When the paper is turning up on the margin. we put a glass plate on, and on the latter a weight; after half an hour it will lie straight on it again. We should not anyhow begin sooner with the development. We commence to develop with luke-warm water (28° R.), after which we take warmer water. If the collodion by the development should get rinsed off, we have either to wait some hours between laying the paper on the plate and the development, or we have to cover the glass plate with a thin solution of gutta-percha in chloroform. But this coating must be entirely dry; the picture sticks on it very well.

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* *Archiv.*

The diapositive sometimes needs, after washing, a strengthening; but this, unfortunately, is not appliable with gelatinizend glasses, for the underground would colour also. With bare or collodionized glasses the effect is often very favourable.

For this, two solutions are necessary, namely:

(*a.*)	Permanganate of potash ...	2 grammes
	Water	500 ,,
(*b.*)	Sugar	1 gramme
	Ammoniac	1 ,,
	Water	500 grammes

We have to put equal parts of *a* and *b* in a dish, mix it, and lay the negative in it; its colour is changed thereby into yellowish. This strengthening for the above purpose must not be excessively done. It has, in preference to other in many respects very useful methods of strengthening, the advantage of changing only the colour of the picture, and settles no granular precipitate, like a decoction of logwood, Selle's strengthener, &c.

In a dry condition, with the picture side lying on white paper, the picture must appear darker than a good paper picture.

The retouch of this diapositive for strengthening the shadows is done with the paper or leather wiper and the finest graphite powder, which sticks very well without the application of glycerine, for blotting out and sharpening, an ink-brush and China ink. Also with lead pencils we may retouch the pigment picture, but must be careful not to spoil it.

A TRIP TO THE HEBRIDES.

BY REUBEN MITCHELL.*

Our next excursion was to Loch Cornisk, about nine miles and a-half from Sligachan. Our party consisted of myself and young friend, and a German gentleman. Having arranged for starting early on ponies, with my instruments, pannier fashion as before, our route was through Glen Sligachan, a wild and picturesque place, the path being very rough and sinuous, at times scarcely indicated, small streams and bogs to be frequently passed, and the river Sligacan winding its way through the Glen. On our right Scuir-na-Gillean, looking dark and frowning, the misty clouds clinging to the crags in most picturesque forms. On the left we passed Marscow, which has a most commanding appearance, rising in the middle of the Glen with a very fine outline. Close on the base is an isolated shepherd's cottage, several miles distant from any other dwelling. It would scarcely be noticed unless pointed out; it appears such a small speck in the wilderness. Pushing on in advance, we had taken the wrong path, and were near the foot of Blaven, another of the Chucullins, when one of our guides came running after us, and informed us that we had come two mile out of the right path. We had to cross the valley to get on the right one; here we had a very good view of Blaven. Though it is a grand old mountain, I do not think its outlines were so grand as others of the Chucullins. There is a small loch called Loch-na-Main. at the head of Glen Sligachan. Our way out of the Glen was up a very rough mountain path, very difficult for the ponies to ascend. Having arrived at the top, we had a fine view of Loch Scaving and Loch Cornisk. The distance from this place down to the loch is about two miles. I advise all who come so far to see Cornisk to descend to the margin of the loch; they will be well repaid for the extra trouble. Our guides unsaddled, hobbled, and turned the ponies loose to browse. We took some of the lighter parts of our instruments, and the guides strapped my boxes on their backs. We descended into the Glen, the guides taking the nearest route to the lake, and we starting before them without inquiring the best route, descended into the bottom of the Glen, and then we had a considerable distance to go to get to the lake alongside of the burn, it winding its way slowly towards the loch till it comes to the descent. which soon assumes a most wild and picturesque stream, rushing over rocks and boulders in all directions, and at last mingling with the silent loch below. The rocks, and especially the burn, are a coarse dirty red colour; and no fear of slipping, as the surface is rough, similar to a rasp file, which may be traversed at a considerable angle without any danger of slipping. My first picture was taken about half a mile from the lake, the burn making a good foreground, Cornisk and Scavaig in the distance. The difference of elevation of the two lochs is not great; the one divided by a narrow strip of land and rocks, Cornisk emptying its water into Loch Seavaig below. A steamer made its appearance at the head of Loch Scavaig and landed a number of tourists, who walked about for a short time and then left by the steamer, which looked very much out of place in such a wild region steaming about. The weather had altered very much during the day from slight rain and sunshine, and now assuming a very threatening and gloomy aspect. I had my camera removed down to the side of the loch, the burn being of the wildest character, huge rocks, the water tumbling over them into the pools below in the wildest confusion. The loch is not large, but it has a solemn grandeur, the cliffs rising to an enormous height on both sides, and mingling with the clouds in gloomy weather, which, unfortunately for us, gradually grew worse; the rain and mist almost made it impossible to see the picture on the ground glass, but having come we were determined to expose our plates. I got four good pictures, my friend and several of our other companions did some sketching under difficulties, of which we all, unfortunately, had to have a share. Having put up my camera, &c., I started before the others, the guides having to carry our boxes out of the Glen. The rain was descending freely when I left, about five o'clock. I took the side of the burn, the rocks so adhesive it enabled me to ascend much better. The guides overtook me when about half way out of the Glen, and very kindly relieved me of my overcoat and other impediments. It was no easy task to ascend through a wet slushey mountain side through pouring rain, but we at last got to the top; but how the two guides carried our boxes, which were very heavy, out of the Glen two miles up such a steep incline is still a matter of surprise to me. I must in justice to these and the others supplied us from the Sligacan Hotel, say, were most kind and willing assistants. Being very wet, especially on my feet, I started a little before the others, as soon as my pony was saddled, and led it down the mountain side, not deeming it safe to ride. My young friend soon came in sight. We had to pick our way carefully, the rain having made it more difficult, but we arrived safely in Glen Sligachan, and made the best way we could through drenching rain and numbers of streams accumulated from the rain, some of considerable depth. The Glen had the most gloomy appearance imaginable. By the time we arrived at the Slingacan Hotel it was nearly dark. We changed our wet clothes and put on dry ones, our kind, and always attentive host brought us some hot tea and whisky to our bedrooms, which soon dispelled the cold. Dinner being ready quickly after our arrival, we did ample justice to it, and I am glad to say we did not take cold or suffer in any way from the drenching we got, and our plates turned out very satisfactory, considering the difficulties under which they were taken.

(To be continued.)

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* Continued from page 449.

THE PRESS AND THE EXHIBITION.

(Illustrated London News.)

This Society has again opened its annual exhibition at the Gallery of the Old Water Colour Society, Pall Mall. The display is, as usual, highly interesting, though not so comprehensive as it might be; the contributions of given exhibitors are, in many cases, unnecessarily abundant, while, on the other hand, several leading practitioners still stand aloof from the Society. The main object of these exhibitions should be to bring forward new discoveries in photographic science, if any there be during the year, or to display for the instruction of the profession any newly-invented processes or appliances of photographic art. These, however, do not appear to be the objects of some exhibitors; on the contrary, they seem to care only to monopolise as much space as possible for wares that have no claim to novelty of interest. But we need not dwell on what is so obvious. From the evidence afforded by this exhibition we should conclude that nothing of really essential importance in regard to the actual chemical or optical progress of the art has been achieved this year, but that the applications of photography are constantly becoming more numerous and ingenious. Photography we have always with us now. We can have it as a witness, slave, servant, or friend, on our very clothes and dresses, on our wall-papers, on our tables, over-running our libraries, at home or abroad; there is hardly any situation of life in which it does not establish some relation with us. Yet it is always the same thing; it never surprises us by yielding the kind of delight that fine art affords. It is on account of this, as well as for other reasons, that we have always felt the futility of attempts to produce a "picture" in the full sense of the word (of course *minus* colour) by the combination of any photographic processes. A mechanical joining of two or more negatives can never be so satisfactory as the representation of one, for the reason that the two or more can never exactly correspond, and their discrepancy imports a falsity into the result which should not be chargeable to an art that of itself is veracious. Yet, apart from the false principle, a great deal of skill and taste may be displayed in the preparation of these nondescript "prints." The most prominent is not, however, the most successful example this year, viz., "Yes or No"—a sailor proposing to a fisher-girl, by Mr. Young; the sailor, having been posed separately, does not look at the girl, and various parts of the composition are sadly confused with each other. The aim at producing a "picture"—that is, to tell a story with a figure-composition, and by simple, direct means—is, of course, perfectly legitimate, and the following will illustrate the distinction we have pointed out:—"On Guard"—a dog caught lying awake beside a child sleeping in a cradle; the same subject with the mother leaving the child, by Mr. G. Nesbitt, and other subjects by this photographer. Examples of pictorial portrait groups, by J. Chaffin and Sons may also be named:—"Checkmated"—ladies engaged over a game of chess; and "The Trio"—a gentleman and two ladies, musicians. We may also mention in this category, "Water Lilies," by A. Ford Smith—three ladies at a lake, with one stooping to gather the flowers. These photographs have some of the character of pictures—that is to say, in the sense that it is alone possible in photography; an attempt to go beyond this, and pretend to really rival fine art by patching together a number of necessarily discordant items of an imaginary incident, is as futile as it is illogical. There is a great deal, besides, in these exhibitions which must perforce be accepted or allowed, though it cannot be admitted as genuine. Such, for instance, as fancy painted backgrounds to portraits; skies, real or artificial, introduced to views too bright relatively to admit of their truthful introduction; and the "stippling" up of the flesh of portraits. This last is done to an extent never dreamt of when photography was in its innocent youth. It would be a good check upon this if the Society were to insist on the exhibition of, at least, one "untouched" print by all figure-photographers, so as to afford a test of the manipulator's ability; yet would be almost impossible to carry out, for we suspect that some means of evading the test and meeting the requirements of the public would be discovered. The portraits of M. Boucher and Messrs. Lombardi and Co. are obnoxious to our remarks; but it is invidious to particularise, so common is the practice. The contributions of these photographers are, however, rich in effect and brilliantly lighted. These qualities are also conspicuous in the two groups by Chaffin and Sons, already named, and we should have added that they are remarkable as being the largest size photographs direct from life (without enlargement); that this is the case is evident from the strength of the contrasts. Continuing our search for artistic portraiture, we have two frames of "Studies," with Arthurian titles, by Mrs. Cameron (mediately through the autotype process), which, as usual, are remarkable for dignity, beauty, and expressiveness, as well as for that breadth, softness, and suggestiveness of movement attainable by posing the figures a little "out of focus." Close to these are frames of children's portraits by R. Faulkner and Co., who are entirely unrivalled in this speciality. Taken by the instantaneous process, these photographs snatch from the little sitters a grace almost beyond the reach of art itself. It would be difficult to imagine anything more charming than this children's gallery. Not less delightful are some larger portraits of children on an opal ground, painted out from vignettes, an fashion, so as to resemble mezzotint engravings, sufficiently per- closely, and, at the same time, suggesting (as eviden the former child-portraits of Reynolds or Gainsborough. We spe numbered mend to notice little "Winifred Peploe," and plate is Morison." Other commendable portrait and figure works R. Slingsby, of Norwich; several frames with fancy backgro high, by W. and H. Fry—very delicately treated; the series of "Men ect, Mark," from Messrs. Lock and Whitfield's negatives, produced by the Woodburytype process (which we have noticed on its monthly publication); "Pictures of Artists in Armour," by R. Taylor, and others. The Autotype and Woodbury Companies compete with each other in the number of portrait enlargements they send. By the former there is a gigantic half-length of the Queen, and portraits, nearly as large, of various members of the Royal family. We confess we have little love for these necessarily much painted-over and inevitably-distorted productions. The Woodbury Company sends, besides portraits, copies of works of art, views of buildings, foreign sites of interest, and so forth. Many of the landscapes so nearly approach perfection in the delineation of the infinite delicacy, minutiæ, and beauty of nature, that it is very hard to select for special eulogy. Nearly all the first hundred photographs are landscapes, and praise might be distributed to almost every one for clearness and sharpness, for tenderness or richness of tone, or for fulness and largeness of impression. Here, as in the figure department, the amateurs are in force. Mr. Crawshay, one of their number, who has always taken a prominent place in these exhibitions, and who formerly offered prizes for competition (which, by the way, are believed to have had the contrary effect to that intended)*, has quite an extensive collection of views, chiefly in Wales. These are admirable alike from the artistic and manipulative point of view; that is to say, they have a sense of composition and effect in the point of view chosen and a feeling for tone, while they are pure, clear, and crisp to a point that must satisfy the most exigeant operator. Colonel Stuart Wortley is another amateur of the highest attainments. He continues his studies of those effects of sky and sea which are most difficult in photography, and his triumphs are great—see particularly "Clouds," with their silver lining, and "Desolate," a stranded ship on a solitary shore under a sad sky. How wonderful is photography when it momentarily, yet for ever, catches the moonbeam at the cloud's edge, or the shimmer on weltering and breaking waves! Mr. William Bedford, son of the well-known Francis Bedford, exhibits several beautiful works which have a peculiar grey tone, produced by some process known only, we believe, to this very promising photographer himself. On the whole, however, we prefer the warmer tone of ordinary silver prints. The Royal Engineers and their officer, Captain Abney, the Rev. W. A. Atkins, and others, enrich the collection with many views in Egypt, India, and other countries, which greatly enhances the interest and instructiveness of the gathering. In such views and in reproductions of works of art—of which there are also many examples here—photography is unrivalled. The exhibition will remain open until November the 14th, and the 350 items it contains will repay more than one visit.

Indelible Ink without Silver.—Mr. A. J. Foose, of Del Norte, Colorado, sends us (*Scientific American*) the following formula for an indelible ink without the use of nitrate of silver, which, he maintains, is thoroughly efficient and capable of resisting the action of freezing and thawing. No. 1. Extract of logwood, 1 lb.; water, 1 gallon. No. 2. Sulph. prot. of iron, 4 ounces; water, 4 ounces. No. 3. Sulphuret of potassium, ¼ ounce; water, 2 ounces. After dissolving the logwood by boiling, add No. 3 to No. 2, until the iron assumes a black colour; then add this compound to No. 1, and boil a few minutes. Add cyanide of potassium, half ounce, which fixes the colour. For ink, add gum and alcohol; for dyes, add grease.

To Remove Nitrate of Silver Stains.—The following method of removing indelible ink and other silver stains, without the use of cyanide of potassium, is given by Grimm in the *Polytechnisches Notizblatt*:—"Chloride of copper is first applied to the tissue; it is next washed with hyposulphite of soda solution, and afterwards with water. It is said that this may be employed on coloured woven cotton tissues. For white cottons and linens, dilute solutions of permanganate of potash and hydrochloric acid, followed by the hyposulphite of soda and clear water, is preferable. For cleaning the hands, we use iodine dissolved either in iodide of potassium or in alcohol, following by aqua ammonia."

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* It would be interesting to know upon what principle any one can imagine that the offer of valuable prizes could have a deterrent effect upon experiment in any direction!—Ed. Photo. News.

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Photographic News.

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PROCESSES AT THE EXHIBITION.

A correspondent, much interested in photography as an amateur, writes to complain of the paucity of obtainable information regarding the pictures at the present exhibition. He complains that the information on the pictures, and in the catalogue, as to the modes by which the pictures were taken, the apparatus used, and other details of production, which at one time used frequently to be given, is now almost entirely absent, and he urges that we should propose to some of the most skilled exhibitors that they should give a resume of their operations, and permit us to publish the information during the time the exhibition remains open for the benefit and instruction of photographers at large. Our correspondent does not send his letter for publication, but we may, without impropriety, make some extracts the better to explain his views. He says:—

"As a tyro at photography I visited the Photographic Exhibition the other day, and was grieved to find that information with regard to the means adopted to produce the magnificent results obtained by some of the exhibitors was even more scanty than in former years, when I only went to it as a collection of beautiful works of art. Will you, therefore, allow me to suggest that it would be an immense boon to beginners, and possibly also to the more advanced, if you could get a series of short articles written for the Photographic News by some of the exhibitors before the close of the exhibition, giving details as to the processes adopted for both negatives and prints, the time of year when the pictures were taken and the exposure given, the shade, backing, stop and lens used, the nominal size of the pictures capable of being taken by the lens, and the dimensions of that really taken with it, &c."

Our correspondent then proceeds to specially mention the name of one gentleman whose information "would be simply invaluable," referring to Mr. Crawshay. "In his pictures," he observes, "at the same time that there is any amount of sharpness and detail, there is an artistic softness which seems to be enhanced by the tone of the prints, and which does not obtain in any other views exhibited; morover, an imperfection, only too common, viz., 'blurring,' where light passes through gaps in trees, seems wholly absent from his pictures."

At one time the practice of giving much fuller information as to the mode of production prevailed, both on the pictures and in the catalogue, and doubtless that practice was both interesting and instructive to young photographers. The precise object of rigorously excluding all inscriptions on the pictures, giving information of any kind, we cannot explain, as the absence of some information undoubtedly robs the exhibition of much interest. We can understand the necessity of a rule limiting the information as being desirable on various grounds. If unlimited permission to label pictures to any extent existed, the artistic effect, not only of the individual pictures, but of the exhibition itself, might be marred by large obtrusive labels of an advertising character. It is furthermore argued by some that photography has passed the stage in its history when merely technical questions need to be obtruded at exhibitions, and that details of process would be as much out of place at a photographic exhibition as information regarding the canvas, colours, and pencils would be at an exhibition of paintings. The assumption of such persons is, that all elementary information is obtainable elsewhere, and that the exhibition is rather to illustrate what photography and photographers can do in producing pictures, than to teach the technical details of how they are produced. In short, that photography should be regarded as an art, and that its products are works of art rather than products of a mechanical process.

The conditions of exhibition announced by the society, whilst prohibiting all inscriptions on the pictures or frames, invited information for insertion in the catalogue, and it is to be regretted that this is of so meagre a character. Whether this circumstance is due to the paucity of the information sent, or to the limits of the catalogue and the short time available for preparing it, we cannot tell; but certain it is, the information is less copious than we have ever seen it. In very few cases indeed are we informed as to whether the pictures are produced by means of the wet or the dry process; in the case of many large pictures there is no information whether they were produced direct or by enlargement. And so of other interesting details, the addition of which would have give value to the catalogue.

It is probable that many of the contributors would feel that they had really no information of importance to convey but what was accessible to and known to every photographer. Take, as an example, the gentleman to whom our correspondence especially refers. Mr. Crawshay's landscapes are not surpassed by any in the exhibition, either for artistic qualities or technical excellence; and yet we feel satisfied that he would disclaim any speciality of process, or secret in the mode of producing them. Of course, he uses the best lenses, and material appliances generally, which he can obtain; but for the rest, he employs the ordinary wet process known to everyone. The main cause of the special excellence of his work is the special care and skill devoted to it. In every detail of the operations it is not simply an aim, but the necessity of his nature, that everything shall be done well. A fastidious precision and care govern all the manipulations in every department. Of course, fine taste to select a view, judgment to select the light, time of day, exposure, and development, are due partly to natural qualities, and partly to experience, and, without these mere painstaking, would not suffice to secure such results as those our correspondent admires. But we merely wish to point out that the mechanical details which could be described are rarely of a secret character, the results depending more upon personal qualities in the photographer than in peculiarity of his process.

Nevertheless, we shall have much pleasure in carrying out our correspondent's suggestion if exhibitors will aid us by sending brief resumés of the precise mode of working they employ, with formulæ and other details suggested in the letter we have quoted. That which to the photographer himself seems commonplace and not worth repeating, is often full of interest to others, either by its suggestiveness in indicating improvements which may be adopted, or in confirming a practice already tried, but which, in the novice's hands, has not yet produced results like those of the more skilled and experienced photographer. It is scarcely possible for a successful photographer to give a detailed description of his operations without teaching something valuable to others, which may never have occurred to him as worthy of mention. Hence we always welcome a fresh description of the oldest processes.

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PHOTO-BLOCK PRINTING.

We are from time to time reminded of the extraordinary fact that photo-block printing has not yet taken a practical and commercial position in this country. We have seen admirable examples from time to time, have heard of various commercial ventures, but we do not know of any establishment where such work is regularly done. In conversations with editors and proprietors of various illustrated serials, we are assured that a method which would produce results equal to wood engraving in a shorter time, and at a reasonably reduced price, would be an inestimable boon. A general impression seems to prevail, moreover, amongst those most concerned in using such blocks, to the effect that the processes hitherto introduced have been failures. That such need not be the case is manifest from the success of the Photo-Engraving Company in the United States. We have received their illustrated quarterly circular, issued every three months, to bring novelty or examples of progress under the attention of all concerned. It contains some capital examples of photo-block printing, consisting of subjects from life, copies of steel and wood engravings, and from hand drawings. A year ago they had produced over fifty thousand blocks, and were employing about sixty assistants, who were doing as much work as would be accomplished by a thousand wood engravers.

The precise mode of working in producing these blocks is not made public, but, so far as we can glean, a plaster cast from a gelatine relief is the basis of the metal block obtained. The mode of converting a photograph in half-tone into an image in line is interesting, and is described by the *Scientific American*. It says:—

"One of the methods devised by Mr. Moss to save labour in the production of pen drawings is this: the copy from which a drawing is to made is photographed double the size of the plate required, on arrowroot paper, and then 'fixed' and well washed, but not toned. Directly upon this print the drawing is made with a pen and india ink. When the outlines and all the important parts of the drawing are complete, a saturated solution of corrosive sublimate in alcohol is flowed over the drawing, which bleaches away the photographic colour without at all injuring the lines in ink. The finishing touches are then added, when the drawing is ready to be reduced and engraved. Thus the tedious operations of sketching and tracing are obviated, and a degree of accuracy is secured which it would be difficult to obtain by any other means.

Regarding the mode of working, some idea may be gleaned from the following description given in *The Iron Age*. It says:—

"As some of the most important parts of the process are kept secret, we cannot give a full description of the methods employed in making the photo-engravings. It differs from most other methods in that there is no etching or 'biting in' of the lines by the action of acid. In brief, the history of a plate may be stated thus: the subject, properly prepared, goes to the photograph gallery, where a negative is made in the usual way, except that it is required to be more perfect in detail than any other known to the photographic art. The negative goes to the secret department, whence comes a plaster of Paris mould, which is sent to the stereotype foundry. The substance in which it is cast is ordinary stereotype metal, with some modifications, the constituents being mixed in the company's own works. Coming out of the cast, the rough plate goes to the printer to be tested. When 'passed,' it is forwarded to the 'finishers,' who are, for the most part, regular wood engravers, who deepen the wider spaces, and 'touch up' any portions which may not have come out sufficiently perfect. Then 'clean' and 'file' proofs are taken, the former to be sent to the customer, and the latter, properly numbered to be pasted in a scrap book for reference, and the plate is delivered to the 'blocker' to be mounted type high, when it is ready for use. It may be printed from direct, or, if desired, electrotypes or duplicate stereotypes may be made from it in the usual way. The operations above described require for their execution only a few hours, producing results which might occupy as many days of a skilful engraver's time.

"Further improvements will undoubtedly be made, as Mr. Moss is constantly experimenting, but the results already attained entitle his invention to recognition as of great practical value."

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LARGE DIRECT HEADS.

Some artists in America are, it seems, taking up the idea to which Mr. Crawshay recently gave an impulse, by offering munificent prizes. Some singularly fine life-size heads from negatives taken direct in the camera were the result of Mr. Crawshay's prizes; but the difficulties of production and the smallness of the demand militated against the general adoption of this mode of securing large portraits. In the Centennial Exhibition, in Philadelphia, Mr. Kent, of Rochester, exhibits some life-size heads described as taken direct, of such excellence that all critics are charmed with them many puzzled, and some openly express doubts as to the truth of the announcement that they are "contact prints from direct negatives" in the camera. The critic of the *Philadelphia Photographer*, speaking of their unusual excellence, comes to the conclusion, in spite of the announcement, that he is "disposed to believe that they are enlarged by the Edwards' process." Mr. Kent subsequently writes to express his regret that the veracity of his announcement has been doubted, and to re-affirm the fact that the prints are "from direct negatives, printed in contact, and that there is no dodge or cheat about them."

Furthermore, he adds, "they are amongst the first I have made, and only faintly show to what photography may be brought. It would seem to me that in small work perfection has been nearly attained, and that progress now should be in the direction of large pictures at large prices. Any advancement in that direction will, I am sure, be a benefit to our art."

It is interesting to find a skilful and successful professional photographer in the States coming to such a conclusion. This is just the conviction which possessed Mr. Crawshay's mind when he endeavoured to stimulate interest and effort in that direction by large pecuniary prizes. Knowing, however, that experiments in such a direction must be costly, and would not readily be undertaken without some special inducement, he expended a few hundreds of pounds in offering the inducements. The offer, although it elicited some fine examples of what might be done in that direction, was not received with the appreciation it deserved. Hence it is interesting to note Mr. Kent's effort without any inducement.

The mystery which some felt attached to their origin is cleared up in *Anthony's Bulletin*, where it is stated that "these remarkable portraits, which have already deceived so many connoisseurs, were taken direct, with, of course, the Dallmeyer No. 6A Patent Portrait Lens."

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THE PHOTOGRAPHIC EXHIBITION.

Amongst the names which it will afford the visitor pleasure to find in the catalogue, as he glances over the list of exhibitors previous to examining the pictures, is that of Mr. R. Manners Gordon, the presence of whose charming pictures would lend a grace to any exhibition. Alas! however, for the realization of the hopes excited. Here are a few pictures which were once produced by Mr.

Gordon, it is true; but how they came here it is difficult to imagine. They are pictures produced many years ago, not at least up to Mr. Gordon's highest standard, and now showing evidences of the approach of that sickly decay which is so often the fate of silver prints. We fear that their presence must be due to the action of some zealous but injudicious friend, who, possessing the prints, has fancied that by sending them to the Gallery in Pall Mall he was serving Mr. Gordon and the Exhibition; but assuredly it is an ill service to both to display fading prints, however charming they may once have been.

Amongst the new exhibitors whose work we examine with pleasure, we may specially name that of Mr. F. T. Palmer, who contributes some fine landscapes, and has shown taste and judgment in dealing with them. The High Rocks at Cheddar (No. 16) are fine photographs, and the picturesque effect of height is much enchanced by the upright, oblong form and proportions given to the picture. The same is true of the Cascade at Triege (No. 17), the shape of the picture greatly enhancing the effect of the waterfall. Mont Blanc is a fine picture, so far as we can judge; but as it hangs close to the ground it is difficult to examine; whilst Chamounix Valley (No. 23) is so high as to be beyond our range of vision for examination. Badgeworthy, Waterslide, Devon (71), is a charming bit, and Montreaux, Chillin, and the Dent de Midi (266), is a fine picture. All these pictures are slightly marred, in our estimation, by the parti-coloured mounts; the bright tint within the grey detracts something from the effect of the picture.

B. Wyles and Co. send some fine landscapes of an essentially pictorial character, and some studies of a wreck, which are full of poetical suggestion. Moonlight at Bettws-y-Coed (251) is very fine; as is also the Miner's Bridge at the same place. Messrs. A. and J. Bool's large landscape On the River Wandle (25) is a very fine picture. The scene is well chosen, the figures well placed, and there are space and atmosphere in the picture, which is a thoroughly effective bit of nature. The view of Westminster Abbey by the same firm is also exceedingly good. We have a fine imposing view of the noble structure, with its surroundings, which give the true effect to the scene. Exactly in contrast, and, pictorially, everything it should not be, is the view of the recently demolished Northumberland House (61), exhibited by Lombardi and Co., who make the long ugly facade fill a long ugly picture. Mr. J. Milman Brown has very effective pictures of good size. No. 33 (The Village of Carisbrooke) is singularly fine, the foreground of trees and foliage, houses somewhat in the distance being very effective indeed. The Wishing Gate (12), Giant Ash (13), and Falling Leaves (34), are also fine. The Rustic Bridge, Shanklin Chine (68), and the Trysting Tree (69), are also excellent, the rendering of glen scenery being exceedingly charming. Mr. W. D Sanderson, a staunch adherent of the collodio-albumen process, gives full proof that, although the oldest of the dry processes, it is equal in result to the most recently improved of all the dry methods. Mr. Sanderson's pictures, which are very large, are, however, something more than mere examples of a process; they are fine pictorial landscapes. A Trout Stream (249) is a most charming picture. Mr. W. Ferguson sends some fine pictures of the English lake scenery, chiefly in the neighbourhood of Derwentwater and Borrowdale. All the views are fine, and we shall be glad to see him produce more of the district, which has hitherto received but scant justice from photography.

Captain Abney's contributions, always good, are this year less important than usual. The Brook (89), The Rivulet (319), and the Woodland Lane (322), are three charming little pictures. Some admirable photo-mechanical prints from Egyptian negatives, by Captain Abney, are exhibited by the Woodbury Printing Company. The Royal Engineers under Captain Abney's instruction contribute extensively, and all their pictures are good. Mr. Baynham Jones contributes several pictures of small size but considerable merit, a truthful, natural, atmospheric quality giving much value to many of them. Mr. Brownrigg's landscapes are always welcome, consisting, as they always do, of admirably picturesque bits of scenery, perfectly rendered. Nos. 2 and 3 (A Ravine in Glen Ashmol, and a Rapid in Glen Druid) are both very charming; the rush of water, absolutely transparent and moving, is very finely rendered. The other views in Glen Druid are also very excellent. Mr. J. H. Mann's Gibraltar views are very fine, and contain some well-placed figures. Mr. G. E. Dew's landscapes are somewhat unequal in quality. The Old Grist Mill on the Avon (19) is excellent in every way, whilst the Chapel and Hermitage, St. Cassien (11), is too low in tone and monotonous in effect. Mr. S. G. Payne's Old and New Houses in the Vale of Aylesbury are interesting and good as photographs, but consist too entirely of the buildings alone to make pictures. The scenes in Rome and Naples by the Rev. W. A. C. Atkins are very interesting, and many of them very fine. Mr. G. Mansfield's work is somewhat unequal; the Beech Walk, Morristown, is one of the best.

Mr. Reuben Mitchell, whose contributions are generally amongst the finest pictorial work in the exhibition, sends only one example to this, but of larger size than his former photographs. It is a scene in the wild Hebrides, "Curry-na-creik," Isle of Skye—a bleak, rocky, lonely hill, admirably rendered, the sternly cloudy sky admirably carrying out the poetical sense of wild desolation. Mr. Edward Fox sends some excellent pictures, of which an Interior (282) is best. A large series of Views in the Forest of Fontainebleau, by Mr. J. H. C. Harrison, are well worthy of careful examination, as not only fine photographs of charming bits of forest scenery, but also admirable examples of carbon printing. This series will well repay repeated inspection.

The majority of the landscapes hung are of large size, 12 by 10, 16 by 12, and still larger sizes prevailing. There are some pictures of cabinet size and smaller possessing much interest. Mr. Woodbury's series of little pictures of Italy (106), produced on Liverpool emulsion plates, are both excellent and interesting. Mr. F. H. Henry's little views in Lynton and Lynmouth, on emulsion plates prepared with bromide of zinc, are interesting as examples of the process. Mr. J. D. Ratcliffe shows a pretty country Cottage produced on one of Kennett's pellicle plates. Mr. R. Gordon exhibits a large number of interesting cabinet views in France, of varying merit. Mr. H. Whitfield has a couple of pretty rural scenes. Bits in Russian Lapland by Mr. W. J. A. Grant (228) are very interesting and capital pictures. There are probably a few views which we have overlooked, and to which we may return, but these constitute the chief of this year's landscape display.

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THE NATIONAL PHOTOGRAPHIC ASSOCIATION, U.S.

The National Photographic Association of the United States, which has for some time been in a moribund state, has, we are glad to learn from our Philadelphia contemporary, revived again. Its managers seized the occasion of the Centennial Exhibition for a special effort to secure another convention, in which they have been successful; Mr. W. H. Rulofson, of San Francisco, being president on the occasion. The proceedings were opened by all the members singing the "Star-spangled Banner," Dr. Vogel leading the singing and presiding at the piano. An address from General Hawley followed, and after that, Mr. R. J. Chute, the local secretary, gave an address of welcome to the members. His remarks were eloquent and interesting, but not without a dash of "spread-eagleism," when he declared that in photography "America leads the world." We have noticed from time to time the rare excellence of the American portraiture submitted for our attention, and it is certain that in whatever country an international exhibition may be held, the contributions, being most extensive from that country, have every facility for taking precedence; but without denying the merit of any, we should hesitate, when we remember the portraiture of Adam-Salomon in Paris, of Fritz Luckhardt in Vienna, of Löcher and Petsch and others in Berlin, of Bergamasco and Denier in St. Petersburgh, of Notman and Kurtz and Sarony across the Atlantic; when we remember the art photography of Rejlander and Robinson, and the landscape work generally of this country, to say that any country took precedence of others in the practice of photography. Here are a few of Mr. Chute's excellent remarks:—

Of all the grand and curious things to be seen here, there is no department to which so much professional interest attaches for us as the magnificent collection of art photograyhy in Photographic Hall. There you will all love to go and dwell upon the splendid products of the camera: to study them with eager interest and critical eyes; to compare the East and the West, the North and the South; to place Europe and America in the balance, and note the progress of the isles of the sea. And, fellow-photographers of America, may we not be excused for a feeling of pride, a feeling of congratulation, and be stimulated to nobler efforts in the future, when we come to the only conclusion to which all impartial minds seem to arrive, which is that in photographic art in the great Centennial Exhibition America leads the world? This is certainly most gratifying, when but a few years ago we were so far behind the best European artists. And who will say that this progress has not been mainly due to the work of the National Photographic Association? Let none of us aim to be finished artists, but rather progressive. The man who arrives at the top of his ladder soon discovers that his neighbour has a much longer one that reaches far above him. We may do well to emulate the ancient Greeks in practising our art for the love of it, rather than with the expectation of arriving at any certain stage of perfection. Ignoring monstrosities and improbable effects, adhere to the simplicity and truth of nature, and in portraiture put all we can of humanity into our work. In this way we, like them, may reach the highest attainments of art, or transmit it in such progressive form to our children, that they following the good example set them by us, may go on unfolding and developing this art science till in Photographys Centennial year it shall be a marvel of usefulness, approaching the completeness and perfection of art."

Some further addresses, reading of reports, and words of welcome, closed the first morning's session.

The afternoon session opened with a very interesting address from Mr. A. S. Southworth, who is, we believe, the Nestor of photography in the States. He remarks of the photographic exhibition,—"I spent eight days in those rooms, and I am like the little boy who sat down to the table to a plate of dumpling, 'he ate till he was full, and cried because he couldn't eat any more.' My time is almost expired, and I tell you this, those of you who intend to make pictures for a living ought to make them for the pleasure of it; if you can help yourselves in any way in the world, it will be by means of those pictures." Mr. Southworth, as an old portraitist, is not fond of bizarre effects in the lighting. He says:—

If you will go into the rooms where our photographs are exhibited, you will find that the very men who first practised and produced the very first pictures of a certain school—I will simply give the name so that you will understand it, the brilliant pictures, the Rembrant pictures—have abandoned them. They are all gone; there is not a single one hanging on the walls where they make their exhibition Now I want you, for me, to look at the pictures. I don't name individuals because one is better than the another, but simply to draw your attention to them. I want you to look at Kurtz's and Sarony's pictures and the English pictures. You will find none of them have what are called the Rembrandt style. The shadow of every picture is lighted to the bottom; it is clear, tranparent; there is no charcoal or water; it has the photographic action on the photograph, showing it was sufficient to develop the form of the picture to the bottom. Now, I say, beware of imitating faults. It is very easy for those who are imitators to imitate faults more so than to correct them. As regards progress: and I simply say in reference to that, that one-half of the American photographers are as far along as the very best of them were three years ago at our exhibition in Cleveland, and at our exhibitions in Philadelphia, in Chicago, in Boston, and in St. Louis. These exhibitions have done it more than anything else.

Papers on "Climbing the Ladder," on "Photographic Rights," on "Insurance," and other subjects, were read, to which we may refer again. A useful lecture was given by Mr. Seavy, who illustrated at the same the best mode of using backgrounds. The last day was spent in matters of business, revising the constitution of the Association, and appointing officers. The permanent secretary is now Mr. J. H. Fitzgibbon, of St. Louis. Finally, the convention was adjourned *sine die.*

USE OF AN ACID COLLODION.

It will be remembered that about a couple of years ago Mr. Frank Eliot detailed, in our columns, his satisfactory use of acid collodion in an alkaline bath. The Editor of *Anthony's Bulletin* recently gives some experiences of the use of a similar collodion in an ordinary bath. He says:—

"It is well known to the writer that acetic acid is a valuable adjunct to collodions. Our first experience of its value was acquired a long while ago, in the early days of photography. A friend having occasion to copy a painting in very hot weather, could not succeed in getting any intensity; no matter how long or short the time of exposure, the picture came out about the same. Attributing the result to the excessive sensitiveness of the film as affected by the hot weather, making the bath and the developer warm, it occurred to me that the only way to overcome this sensitiveness would be to have a slightly acid collodion. The only acid that appeared feasible to use was the glacial acetic. Upon the addition of one drop of it to the ounce of collodion, a perfect negative was produced at the first trial. I have recommended its use since that time, and recollect with pleasure a beautiful series of Hudson River stereos, taken with such collodion. Last summer one of our photographers, working in very hot weather, taking views of public buildings, &c., in New York, was troubled with the same results, pictures flashing out immediately, and with utter lack of strength. Upon trying, at my recommendation, the acidified collodion, the difficulties vanished at once, and the operator succeeded in getting some of the most delicate and beautifully balanced negatives I ever saw.

"It was upon my suggestion, at a meeting of the American Institute Section, that Mr. Dunwick treated the collodion as specified by him, and with the results designated. What is a little remarkable is, that the collodion thus acidified does not seem to change any more quickly than the ordinary. It will thus be seen that the testimony of all who have tried this 'dodge' is in favour of it, and we think any one (even the most conservative English photographer) would be fully warranted in resorting to its use should occasion require."

A NEW INTENSIFIER.

A correspondent of *Anthony's Bulletin* gives the following:—

"I send you a formula for re-intensifying which I think has never been published. As it is original with myself, I will not be accused of sending you a merely copied article. I have used it for many years now, and never did it fail to do its duty.

"*For Line Work.*—Into a saturated solution of sulphate of copper pour a solution of bromide of potassium, enough to turn the colour of the negative to a white. This may be done either by pouring off and on several times, or by leaving it in the dish till the colour changes; the stronger the bromide is in the solution, the quicker will it change. When this stage is attained, wash the plate, and pour on a solution of nitrate of silver The film will now become denser and black. If not dense enough, repeat the operations. It is rarely necessary to go further; but if any disappointment is experienced, it is a sure sign of derangement of the bath, perhaps too weak, as it is, of course, absolutely required to have enough silver on the negative to take up the bromide. For portraits and similar work it is not required to carry the intensifying to the white stage—simply pouring on the solutions alternately, and immediately washing the plate, till the required intensity is obtained, is enough.

"It may be that some one may find it necessary to give still greater density, or from some cause the negative does not attain to the density it ought to, and no amount of repetitions add anything to the density. Proceed as follows:—Wash the film with a weak solution of cyanide; then pour on a solution of iodide of patassium dissolved in alcohol, with the addition of iodine. The colour will change to yellow, and be very dense.

"Such is the adaptability of this intensifier that almost any of the ordinary re-intensifiers may be used over it. In all cases it is of the utmost importance to commence with clean lines, and not to over-expose."

Correspondence.

THE EXHIBITION.

Sir,—The executive of the Photographic Society do well to hold their exhibition when everybody is out of town, and when country photographers are generally too busy to run up to London. The quality and quantity of the exhibits justify their action. Never was the exhibition smaller in quantity, or poorer in quality; never was our annual show less attractive in effect, or more destitute of novelty. Well might the critic of the *Daily Telegraph*, with withering chaff, deplore that the "peculiar and characteristic skill" of their greatest men, "representative of the highest artistic grade in photography"—Glaisher, Hughes, Stokes, and Spiller!—are absent from the exhibition. It must be gratifying to the members of the late Photographic Society of London that their old association is dead and at peace, and that it is only the new Photographic Society of Great Britain that is being assassinated by incompetence.

Besides the famous old artists whose names I have quoted from the *Daily Telegraph*, I find the following are absent from the exhibition (and I may have omitted several):—Blanchard, Robinson, Wane, Pritchard, Mrs. Cameron,* England, M. Whiting, F. Howard, H. Cooper, Mayland, Mayall, Sutcliffe, Vernon Heath, Abel Lewis, F. M. Good, Earl, Bruce, S. Thompson, Hedges, Piercy, Spode, Viles, Stodart, Hudson, Hubbard.

All the men whose names I have mentioned are alive, and in the full practice of their art; nearly all have been hitherto constant exhibitors, and nearly all are still able to exhibit if they chose. Is it not palpable, sir, that there must be some serious cause or causes why all these good and able photographers abstain from exhibiting their productions? One, or two, or three may fail from natural causes, but not usually thirty.

The only old exhibitors of any consequence (excepting those who exhibit for trade purposes) who send this year are soon told. They are as follows:—Abney, Beasley, W. Bedford, Brooks, Brownrigg, H. G. Cocking, Crawshay, Faulkner, Gordon, Slingsby. Can you add another name, sir? I cannot find one. This falling off of exhibitors almost amounts to a stampede; it certainly indicates ruin to the Exhibition—that exhibition which was a triumphant success under the management of the old Society, and which did not pay its way last year, being under new regime, for the first time for many years promises to be an ignominious failure this year.

Many of the causes for this deplorable result are not far to seek. First and foremost must be placed the dissensions which agitated the Society two or three years ago, and which were totally unnecessary except to pander to the self-love of two or three self-seeking men—agitators and revolutionists—who did not disdain to work in the dark to attain their miserable ends. They failed in their especial objects, but wrecked the Society. The other causes of failure are matters of detail in management. The date was the worst in the whole year. This, I know, is not entirely under the control of the Society; but nothing but a bad time being available, it was possible to avoid having any exhibition at all.

The new style of hanging, by which the productions of the various exhibitors are scattered and frittered away all over the room (first introduced last year) was another help to failure. This method produces curious and very different results. If the pictures of one exhibitor show any variety and originality, they are lost in the crowd; if they are monotonously alike in style, they catch the eye. For instance, I had read so much in the reviews of the landscapes of Mr. W. Bedford and Mr. Crawshay, that I was very desirous to see their works. To find them was like looking for a needle in a pottle of hay, and when found, owing to the surroundings, they were disappointing. The quiet unobtrusive beauty of the pictures of these two gentlemen is greatly obscured by the way they are scattered over the walls, some high up, others on the ground. Your remarks in your last notice on one picture by Mr. Crawshay (The Show) led me to seek it out with more than ordinary patience. I found it literally on the ground. I went on my knees to it, and then was not low enough. I found it, to a photographer, perhaps, the most interesting picture in the exhibition. Imagine my surprise to find the crowd partly composed of gentlemen who are known—at least by sight—to all the photographic world! It was a matter for speculation how they could have all gathered together in a remote village in "Wild Wales." I know several photographers who have refused to send their works to be thus wasted. On the other hand, this fragmentary method of hanging makes some pictures too obtrusive. For instance, the works from the studio of the late A. Boucher are to be seen all over the room. These are admirable photographs—perhaps the best in their style—but they are too much all alike—all to one general pattern. Frame after frame at short intervals all round the room appears to be the exact counterpart of each other, and the result is that in time they become positively annoying in their effect of sameness. Had they been massed the monotony could not have been greater; whilst such variety as did exist would have become apparent by juxtaposition, and the effect of sameness considerably modified.

Another prominent cause of default in the old exhibition was the new and absurd rule which insists that "no name or any information will be allowed to remain on the glass or frame; all labels, names, &c., must be placed at the *back* of each picture." I contend that all possible information should be given (neatly written, not loud advertisements in large red letters) on the margin of each picture. It was a short-sighted policy that tried to compel the sale of a few extra dozens of the catalogue by withholding the information usually attached to the pictures. But there was another evil infinitely to be feared. It was tolerably certain that the rule would not be strictly enforced—that sauce for the goose would not be sauce for the gander. The modest and law-observing photographer would omit even his initials from the front of the picture, while the pushing photographer would write on his mount as usual, and, if in favour with the hangers, it would be allowed to remain—a grossly unfair proceeding. This is so in several instances. The names of the following photographers have been allowed to remain on the outsides of their pictures, together, in some cases, with other information:—Colonel H. Stuart Wortley, S. G. Payne, W. Bedford, W. and A. H. Fry, R. Faulkner,

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* Some prints from old negatives, by Mrs. Cameron, are exhibited as specimens of a process—a degradation of art to material I scarcely expected to see even in an exhibition that contains a portrait of Mrs. Bravo. Does the gifted artist know to what base uses her negatives have descended?

Autotype Company in their Lambertypes, J. C. H. Harrison, and, in one or two instances, Lombardi and Co. Why were these photographers thus favoured?

In conclusion, I should like to say a word or two about the Soirée. I was not there myself, and for some days failed to hear of anyone I knew who had attended, but I found one at last. I noticed that your Liverpool contemporary stated that the attendance was "unusually large." Now I remember the old Exhibition meetings, at which everybody "who was anybody" was to be met. It was the annual meeting of town and country, and the rooms used to be crowded, so that movement was often impossible. Remembering this I wondered where the "unusually large" company could have been packed, and then I met a friend who had attended. I learnt from him that, as urgently requested on the invitation card, some dress coats were worn; they were not so numerous or crowded as to render it a matter of any difficulty to count them, and I hear that including the vice-presidents, there were thirty-three dress coats in the room; add to these about forty members or guests who defied the sumptuary ordinance of the council and went in their usual morning dress, and a few ladies, and you get at the elements and numbers of this incongruous and limited "unusually large" multitude. The society has two secretaries—I presume an ornamental and a useful one. It would avail nothing to ask the former for any comparisons between the members attending the old Exhibition meetings and the late Soiree, for he, without any fault of his own, is too young to the Society to know much about it; besides, I hear he was absent. But I do ask the hard-working and invaluable assistant secretary, or any of the few officers who were there—for I understand that the president, two vice-presidents, the treasurer, the honorary secretary, and many of the council were absent—if my figures do not come somewhere near the truth?

A Country Photographer.

FINAL REPLY TO MR. WILLIAMSON.

Sir,—As I have not the back numbers of your journal with me, being at present resident in the country, I may not be precise in the dates to which I have to allude; but I may safely say that some seven weeks ago I published in your journal a letter exposing Mr. Williamson's, (of course unintentional) mistatements. I find in your last number that, after seven weeks' gestation, he has brought forth a second epistle. In it he says, "Absolute indifference as to anything Mr. Neilson might have to say in reply to my letter is the only explanation I can give of the fact that I never, until the end of last week, saw his answer to it." Some five weeks ago (a communication, it may be presumed by authority) appeared in your journal, stating that Mr. Williamson could not reply to my letter, as he had gone to the country; but it omitted to state that, before his going to the country, he had been some ten days in Edinburgh after the publication of my letter. These two apologies for not having honestly replied when my letter was fresh in the recollection of your readers are equally worthy of (let us say) admiration; and, if they seem somewhat to clash, it must be remembered that genius has sometimes a larger endowment of fancy than of memory, which occasionally leads to extraordinary results.

The gentleman begins his manifesto by informing the public that, though he has resided in Edinburgh for more than ten years, he never heard of my existence. This is interesting; but it is to be feared the public will scarcely see its logical bearing on the medal question. Perhaps the gentleman is an illustration of the line—

> "Whom not to know argues thyself unknown."

At any rate, it is pleasant to find him candidly confessing his ignorance with the same alacrity which he displayed on a former occasion concerning more important matters.

The gist of his letter is to give an emphatic denial to my statements. I am not surprised at this, but I am sorry for it, as all the statements contained in my former letter are strictly correct.

This last effusion of Mr. Williamson, both in matter and manner, is merely a counterpart of his former production a tissue of unfounded assertion and unseemly language. I must decline further communication on the subject.

Mr. Williamson, in concluding, informs your readers that he now leaves them to their own conclusions. And so, the farce being played out, it only remains for the small party whose cause he has advocated to thank him for his peculiar services; although they cannot expect that his name will carry the weight and importance which he seems to attach to it.—I am yours, &c., W. Neilson.

Craglee, Callander, 26th Sept.

KEEPING COFFEE PLATES DRY.

Sir,—If "J. H. W." patience has not been quite exhausted, I shall esteem it a favour if he will kindly state how he overcomes the tendency that coffee plates have for attracting moisture. I thoroughly dry my plates with heat, and store them in "Keene's" tin boxes in a warm place by the fire; nevertheless, I invariably find that in a few hours they have become dull in appearance and rather moist on the surface I presume that it cannot be right to expose them in that state, and that to leave them stored in that condition would be very detrimental to them. This moisture is expelled by a very slight warmth, but one cannot be drying the plates every few hours.

I have no doubt that "J. H. W." is familiar with the appearance I have described, which is of course caused by the hygrometric nature of the preservative, and he may possibly have found a remedy at all events; I shall be much obliged by any information he may be able to give on the subject.—I am, sir, your obedient servant, F. M. Y.

Proceedings of Societies.

Manchester Photographic Society.

The first meeting after the holidays was held at the Memorial Hall, on Thursday evening, the 14th inst., Mr. G. T. Lund vice-president, in the chair.

The minutes of the former meeting were read and confirmed.

Mr. James Young read a letter, from which the following is extracted, handed to him by Mr. Payne, who was unable to attend:—

"Dear Sir,—I am glad to find the hardening of the water has proved effectual in your case, as well as in all cases where the water has been too soft. I will now give you another 'wrinkle,' which answers the purpose of the hard water, with the further advantage of giving density at the same time, and prevents ammonia stain; it is this: when developing your picture add to the pyro. one-third of *table beer* (not porter). I will give it to you as I use it myself in mixing my pyro.:—I put five instead of four grains of the pyro. to the ounce of water. I then pour but two drachms of pyro into the developing glass, to which I add one drachm of the beer. I then add the *full dose* of the bromide and ammonia, and, after soaking the plate as usual in water, I commence the development by pouring on the beer and pyro. It generally takes a little longer before the image makes its appearance. As soon as it does, add a drop of the plain ammonia and water. Density can now be got without risk of stain.

"Again; If you have a thin negative requiring intensification —*i. e.*, after fixing and drying—flood the plate with the acid pyro. of the formula to which has been added some beer, quantity about one-fourth part. Drop into the developing glass a drop or two of the silver; pour back from the plate the pyro. and beer, and then again on to the plate. Intensification now goes on without fear of stain, the shadows being kept beautifully clean. In this way you can intensify to make your negative print purely black and white. It answers admirably where you want to copy engravings, printed matter, maps, &c.

"Mr. Young, I think, had a transparency taken from a print—or, rather, the negative was taken from a print. Both the negative and the transparency were treated in this way. The slow plate, I find, answers better for this kind of work than the rapid or ordinary.—Yours truly, "R. Kennett."

Messrs. Wade and Coote were elected auditors.

Mr. Lund exhibited some prints from negatives taken at Alderley on the 12th August—the twenty-first anniversary of the Society. Mr. Lund used both collodio-albumen and gelatine emulsion plates.

Mr. Chapman exhibited one of Hare's automatic changing-boxes, and also Mr. Woodbury's scenograph and stand.

Mr. James Young exhibited two of Kennett's gelatine emulsion negatives.

Mr. Coote showed some exceedingly fine collodio-albumen negatives, and also some negatives on Liverpool emulsion plates, taken during his recent trip to Ireland.

Mr. Noton said he had an improvement to offer on the albumen distributor he published eleven years ago. The filtration of albumen had always been a difficulty with him, unless it had been considerably diluted. The fresher the eggs and the less water used, the slower it was in passing through the calico—sometimes not at all. Occasionally the settled albumen had been decanted into the distributor from the glass jar in which it had been beaten up; but this was liable to create bubbles. The albumen was now beaten up in the distributor itself, and that was the improvement alluded to. Filtration being dispensed with. time was saved, and thinning of the albumen not required, beyond a determined quantity, for dissolving any salts. In the apparatus on the table he had substituted an ordinary glass gas globe for the other form of container, the smaller opening at the bottom being closed by a cover of gutta-percha, the thickness being about three-sixteenths of an inch. The disc was softened in hot water, the edge squeezed and pulled out thinner, and, while hot and soft, applied to the opening, turned down over the flange, and tied with string, similar to the paper cover to a jar of preserves. The joint being perfectly firm and watertight when cold, a hole was made for the valve as usual. A thread is tied to the top of the valve, the other end being brought over outside the globe. When beating, the valve and thread are away, the tube being stopped up by a small wood plug at the end outside. When the albumen froth has settled down to a liquid the valve may then be put into its place, the wood plug being drawn out. He had not beaten up more than five ounces, but he had no doubt double that quantity might be done at once

A vote of thanks was passed to each of the gentlemen who had contributed to the evening's entertainment, and the meeting was then adjourned.

Talk in the Studio.

Royalty and Photography—Our Royal Family are certainly most indefatigable patrons of photography. We learn that during the recent visit of the Prince of Wales at Branbinghamthorpe, the seat of Mr. C. Sykes, M.P., Mr. Cooper, of Hull, had the honour of producing various groups of the Prince and the party of guests, visitors of Mr. Sykes.

South Kensington Photographs.—We have received the second number of Mr. F. York's photographs of works of art at South Kensington Museum, with descriptive text. The work is admirably done, and the series promises to be a valuable addition to the facilities for art culture which photography has afforded the student.

Photography in the Future.—Mr. J. H. Fitz Gibbon, in a communication to *Anthony's Bulletin*, is very sanguine as to the future of photography. He says:—"Shall I prophesy the future of photography? A hundred years ago, those who would have declared that a likeness of the human face, and all nature, could be taken instantaneously in all its details (in the coming century), and that not only one could be taken the same day, but hundreds by the same person, would be considered crazy, or a witch, and fit subjects for the stake. A hundred years hence (who will live to see it?), pictures, I have no doubt, will be taken in all the natural colours in the dark; all an operator will have to do will be to carry his chemicals and finishing materials in his hat, and by the force of brain power he will produce the perfect likeness of any friend, and no fault finding; all the manipulating he will have to do will be to say, Hold my hat! while he brings forth from it, at will, any quantity of braintype pictures."

Dead Letter Photographs.—In a recent examination of the contents of the Dead Letter Office, Washington, U.S., there were found over one thousand seven hundred photographs which had not been delivered for want of proper address, or other cause.

To Correspondents.

J. M.—There is no room for doubt as to the cause of the sad state of the card enclosed. It is clearly due to the action of the bronze powder employed in printing at the back of the card. The amount of the bronze powder is greater than usual, as besides the name and address, there is an ornamental border, and the royal arms printed. The result is the worst case of fading of a certain kind which we have seen, the greater part of the image being apparently eaten or corroded away.

H. F. H.—If you add hyposulphite solution to other waste solutions you cannot throw the silver in them down as chloride. The washings which go into your cask may be thrown down as chloride by adding hydrochloric acid; but the more dilute these waste solutions—that is, the greater the proportion of water to silver—the slower the precipitation, hence you cannot be sure that you will secure perfect precipitation in one night if there is much water, as there will be if all kinds of washings go into one cask. If you wish to reduce the silver in these washings and in the hypo at one operation you may do so by adding liver of sulphur to the whole, and so throwing down sulphide of silver; or by immersing clean pieces of zinc, and precipitating metallic silver. Read various articles which appeared on the subject in our Year-Books and back volumes of the News.

A. J. Hilder.—You have clearly omitted one important element. You make no mention of the benzole which forms part of the formula. Try this addition—that is, about three drachms of benzole. But there is, we fear, something wrong in some of the ingredients, as all the resins mentioned are soluble, wholly or in some degree, in ether. We have found that a good matt varnish may be made by dissolving thirty grains of sandarac and thirty grains of mastic in a mixture of ether and benzole, an ounce of the former and half an ounce of the latter.

Henry Wilson.—As a rule the platinum toning bath is used in an acid state, and this is probably the case with yours. This being so, the print, if removed from the toning bath to the hypo fixing bath without washing between the two operations, will decompose the hypo, and produce the discolouration of which you complain. 2. The addition of orange chrome will make a good non-actinic varnish for the purpose you require; or Brunswick black dissolved in either benzole or turpentine will serve; or Bates' black varnish, which may be purchased ready for use.

W. G.—An image may be thrown on a screen easily from a small negative by means of a small ordinary camera. Your simplest plan will be to darken a room, place the negative in an aperture in the shutter made to hold it, and then place the lens of the camera opposite the image, and focus it so as to fall upon the screen placed at a proper distance. You will then have no difficulty in tracing such image. This will be the simplest mode of going to work. You may enlarge with artificial light, magic lantern fashion, but more appliances would be required. 2. It is possible to take photographs in an ordinary room, but somewhat difficult to light the head well by means of an ordinary window. Still, by the skilful use of reflecting screens to throw light on the shadowed side it is possible to produce pretty good effects.

R. T. S.—As a rule, the iron solution for developing negatives should not be used more than once, hence the use of the same solution over and over in a dipping bath is accompanied by inconveniences, and, unless the developer have been made with distilled water, the solution will become milky-looking on immersing the first plate. A dipping bath may be used for developing collodion positives without serious disadvantage; but if used for negatives, the necessary exposure will gradually become longer. If a dipping bath be made shallow, and supplied with fresh iron solution each time, then it answers very well.

J. C. S.—The formula you mention (which stands, coffee ten per cent., white sugar four per cent., and boiling water one hundred, when reduced to ounces involves simply the same figures; thus, coffee ten ounces, white sugar four ounces, and boiling water one hundred ounces. Wherever a formula is stated in "parts" or per centages, there need be no difficulty, as you may read it with the same figures in drachms, ounces, or anything you may wish, so long as you preserve the same denomination throughout.

Pinholes.—You simply add three grains of nitrate of baryta for each ounce of silver solution. That is the only step necessary.

J. H. W.—We find that an acknowledgment of the receipt of your negative and prints a fortnight ago was part of a parcel of copy which was lost in the post, and since recovered. The technical qualities of the negative are admirable. Thanks for the prints, and for two received this week without advice of any kind. We print on another page some further queries respecting the coffee process, an answer to which will greatly oblige us.

H. D. Atkinson.—We have not received, and cannot hear anything, of any such letter as you name.

C. J.—Yes, it will probably relieve you of the trouble at once. To each ounce of your silver solution add three grains of the nitrate of baryta. How it acts we cannot with certainty say; but it generally proves a cure for pinholes under such circumstances.

Several Correspondents in our next.

The Photographic News, October 6, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A Free Breakfast Table for the Photographer—Photography and Mechanics.

A Free Breakfast Table for the Photographer.—A week or two back we emphasised the fact that, do what they will in the way of inventing or improving processes, photographers still invariably make use of one of three bodies—albumen, gelatine, or collodion—unless, indeed, as an Irishman might say, they are not photgraphers at all, but Daguerreotypists. Having once laid so much stress on the circumstance that the practice of photography in this respect lies within very narrow limits, we ought, perhaps, to be impartial, to mention that, on the other hand, nearly every class of substance has received application in our art in one way or another. Tea, coffee, honey, isinglass, jelly, treacle, beer, quinine, vinegar, tobacco, sugar, spirits, glycerine, and a hundred and one other miscellaneous articles, have been proposed and made use of in their time, so that any easy-going and plausible assistant might bring in his master a long bill for comestables employed more or less in carrying on photographic duties. Whether the infusion of *cafe noir*, well sweetened with lump sugar, went to preserve dry plates, or the operator; or the pale ale put down among the items of petty cash went for washing collodion films, or the larynx of the plate-cleaner, might be matters very difficult to decide sometimes. Red currant jelly is said to do very well for maintaining a plate in a sensitive condition, and it does, as most of us know, very well, too, on bread and butter. It is especially, we have remarked, when they are "dry," that processes seem to want such things as beer, tea and coffee, and like infusions. Puffing tobacco upon a plate during development, it has been averred more than once, assists in getting out details in an image, although, on the other hand, it must be admitted that defects in printing have been also assigned to the same cause. One might well imagine a gentleman new to the work undertaking the superintendence of a vast photographic establishment for the first time, and being presented with an account by his chief assistant for articles said to be employed in carrying on manipulations in the studio. It might run thus:—

	s.	d.
Coffee, Mocha, ½ pound	1	6
Sugar, best lump, 1 pound	0	6
Six eggs, new	1	6
Golden Returns, packet	1	0
Dilute alcohol (in the form of whiskey and water)...	0	6
Total	5	0

Here would be articles enough to supply a "free breakfast table" for a week, to say nothing of an occasional whiff and a nip to follow. We present the idea to any of our photographic friends, who have a turn for literature, as a good subject for a rattling farce. In fact, we once remember seeing a comedietta in Paris, called *Le Photographe*, in which some very good fun was made out of the manipulations in a photographic studio, and of the complications that arose during the process of posing sitters. Most of the laughter, we recollect, being caused by the assistant always wanting to test (*essayer*) the things he employed in accordance with his master's directions; but as testing and tasting are the same in French, the assistant got rather more than he bargained for when trying to swallow a bottle of silver bath. However, the fashion of employing all sorts of materials in photography seems going out, and the beer and coffee processes are perhaps the only two that have retained the confidence of photographers.

Photography and Mechanics.—In engineering and in mechanics, photography seems every day to grow into greater importance. In carrying out large engineering works and in the construction of mechanical apparatus, &c., photography comes in very aptly as a recorder of "how it's done." Two applications that have lately come under our notice will serve to show the direction in which photography can aid very much. Most people know that there are a great many ways of tying a knot or making a splice. Sailors and artillerymen between them have indeed developed quite a science in the matter, and the number of useful combinations that are to be made now-a-days with suitable rope and tackle is something astonishing. To the initiated, this rope-tying and knot-making is no difficult matter, but let a tyro attempt the task, and he will find at once how hard a one it is. Take the rope and make the knot before his eyes, and he cannot follow you till he has studied the matter for some minutes, while written or verbal explanations are next to useless. And yet a sailor who does not understand the intricacies of a slip-knot or stop-knot, or whatever the hundred and one combinations are called, would be at fault a dozen times a day, and an artilleryman, when it comes to lashing a gun, who did not know one knot from another, would be of little use. To impart better instruction in so useful a science, some photographs have been carefully prepared, showing the method of tying all the various knots employed in the navy and army, and those pictures show almost as clearly as the original "how it's done." The lights and shadows and the aspect of relief possessed by the photograph afford considerable assistance in understanding the various problems which recruits have to set about solving before they have donned their clothes many days. Another instance of usefully applying the camera as a recording instrument in engineering was afforded during the removal of the big eighty-one-ton gun to Shoeburyness, where it is now being experimented with to find out how many miles a cannon ball can be sent. This big mass of metal was no little weight to transport, and hence some skilful mechanical contrivances were had recourse to, to assist in its removal. The manner of lashing the stupendous forging, and lifting it into the barge that conveyed it to the School of Gunnery, was all depicted by photography, so that a proper record of the whole affair might be kept for future reference when other weights of the same nature have to be removed. It is not long ago that a big casting was transported in India to some distance from its foundry by the aid of a sledge and rollers, which were constructed on reference to a photograph sent out from England, where a similar undertaking had been got over, and where a photograph had, fortunately, been taken. While far more expeditious than taking a sketch, a photograph shows better and more minutely every detail of the work in progress. Most of the large engineering firms in this country are so alive to the value of photography as a rapid mode of depicting machinery and structures that they manufacture, that they have usually a photographer on their staff ready to do their bidding at any moment; and although the depiction of machinery is a matter of some difficulty with the camera, the object is usually fulfilled in a very successful manner. We have, on several occasions, had the pleasure of examining the photographic work produced in large manufactories in the north, at Sheffield, Leeds, Newcastle, &c., and have been surprised at the masterly manner in which the obvious difficulties have been surmounted. For to obtain a smooth and even picture of iron or brass work, with no glaring high lights or heavy blacks, by means of the camera, is no easy task, especially as the workshops in which these heavy and almost immovable machines are situated are, for the most part, ill or unequally lighted. Indeed, a machine-photographer must needs be a clever operator, for he never knows the position that his model may occupy, nor the amount of light that may be at his disposal. Before everything, he must be acquainted with a lustreless and harmless paint, to apply to bright bearings which cannot be dulled in any other way, and he must also be versed in the employment of mirrors for reflecting light upon dark and intricate positions of the machinery.

TRANSPARENCIES ON ALBUMENIZED GLASS PLATES.*

Coat a thin plate of glass (patent plate is the best) with No. 1. When well set, immerse in water for a few minutes, and wash well under a tap. Then coat with No. 2, and drain the first portion off into the sink. Repeat several times, returning the fluid, after the first portion, into the measure, to be filtered and used over again for subsequent plates. The liquid should be poured on to each corner of the plate in succession, in the same manner as coating a plate with collodion. After allowing it to soak in for a minute or two, drain off, and stand the plate on one corner in a warm place or drying cupboard free from dust. The plate should rest with the lower corner on several thicknesses of clean blotting-paper, and must not be disturbed until quite dry, when it must be immersed in solution No. 3. This can be used in a dipping-bath. Lower the plate steadily and slowly into the solution without stopping. Allow the plate to remain in the bath about forty seconds, or not more than one minute. Then rinse under a stream of water for one or two minutes, and flow with clear water, and dry in a dark drying cupboard or box. When quite dry, cover the back of the plate with No. 4, applied with small piece of sponge. When dry, the plate is ready for exposure under the negative in the printing-frame. The time of exposure can only be learned by experience, as it varies according to the light and the intensity of the negative from five seconds to five minutes. As a rough guide, a good printing negative will take not more than fifteen seconds in the shade on a fine clear day, or about the same time as the exposure of a carte negative in the camera. If on development the shadows appear heavy and blurred, and the picture fogged, the exposure has been too long. But if, on the other hand, there should be a want of detail in the lights and half-tones of the picture, then the exposure will have been short. A proper amount of exposure should render exactly all the details, both in lights and shadows, which exist in the original negative.

After removing the plate from the printing-frame, slightly rinse it under tap, and remove the colour from the back. Then proceed to develop the transparency with solution No. 5. This solution should be warmed in a glass flask until the flask is almost too hot to be borne on the back of the hand—about 140°; but the heat required will be less if the plate has full exposure, in which case a little of the cold developer may be added. Pour the solution rapidly over the plate, and then drop into the measure three drops or more of solution No. 6. Mix well with the developer, and flow repeatedly over the plate, rocking it all the time. In a few minutes the shadows of the transparency will appear. As soon as they are visible by transmitted light, wash the plate quickly under a copious stream of water, and gently rub or polish the surface of the film with No. 7, to remove any stains which may appear. Now proceed again with the development, using plenty of the solution No. 5, moderately hot, with occasionally two or three drops of No. 6 added, and well mixed. When the details in the high lights are shown, and the shadows are sufficiently intense, rinse well with cold water, using No. 7 if required, and plunge into bath No. 8. Let it remain in this fifteen or twenty minutes (rocking the dish occasionally), or until the transparency has become of the desired colour; if a brownish tone be wished, a shorter time should be allowed than if a purple or black tone is wanted, which can be obtained by leaving it longer in the bath. On removing the plate from the bath, wash it in several changes of water, and rinse well, and dry spontaneously. No varnish is needed.

For enlarging purposes the transparency should be full of detail in the lights, and not too intense in the shadows. A large negative produced from such a transparency will have all the good printing qualities of a direct negative. The enlargement is best made by diffused daylight, using a copying camera, or, what is better, a darkened room, in the usual way. A piece of ground-glass, rough side next sky, or a piece of tissue-paper placed six inches from the transparency, should be used to diffuse the light. When a negative the same size as the original is required, it can be made from the transparency by contact in the printing-frame exactly in the same manner as above described. In this way any number of negatives may be made from a suitable transparency.

No. 1.—Good bromo-iodized collodion, rather old and ripe.

No. 2.—Albumen from fresh eggs ...	10 ounces
Acetic acid	1½ drachms.

Stir well with a glass rod for a few minutes, and then let stand twelve hours; then strain through coarse muslin, and filter through cotton or sponge. Now add forty drops strong ammonia. Then in six drachms of water dissolve iodide of ammonium sixty grains, bromide of ditto ten grains, and add the solution to the filtered albumen. Keep well corked in a cool place for use. This will keep a month, or in winter two months.

No. 3. (*Silver Bath*).

Nitrate of silver	1 ounce
Distilled water	8 ounces
Acetic acid	3 ,,

Iodize thoroughly in the usual way, and filter for use. Keep a piece of camphor in this solution, and when it becomes discoloured it may be cleaned with a little kaolin, or exposed to sunlight Considerable depth of colour does not appear to be injurious.

No. 4.—Burnt sienna, finely ground in gum-water.

No. 5 (*Developing Solution*).

Pyrogallic acid	60 grains
Acetic acid	3 ounces
Water	20 ,,
Citric acid	15 grains.

No. 6 (*Silver Solution*).

Nitrate of silver	30 grains
Distilled water	1 ounce.

No. 7.—A tuft of fine cotton-wool, well wetted with water, and free from grit.

No. 8 (*Fixing and Toning Bath*).

Hyposulphite of soda	16 ounces
Water	1 pint
Chloride of gold dissolved in two ounces of water	4 grains.

Mix gradually, and it is ready for use.

Additional Instructions.

If you desire uniform success with the plates, carefully observe what is said in the directions, and note the following:—The quality of the No. 1 is most important; you can do nothing with a horny kind fresh made from inferior cotton. The cotton should be quickly soluble, and it is well to make up with ammonium salts, that it may ripen rapidly. The quality of No. 1 determines whether blisters form or not. No. 0 sometimes prevents them, and it is recommended as a preliminary coating, since it saves labour and avoids dust. To make No. 0, take No. 2, 1 ounce; water, 70 ounces. Do not make it stronger.

Do your best to get a perfectly uniform coating with No. 1; this and thoroughness in working over No. 2 are essential to secure uniform density. Allow No. 2 time to soak in, by leaving the plate on its back for a minute or more, and flow again repeatedly. Allow a good air-space in front of the plates, that they may dry uniformly. If you dry in racks, which we have practised successfully, separate the width of one of the plates. Apply No. 7 to both sides of the plate before the final rinse, after No. 3, when a critical examination in a good light will reveal most of the faults that a plate may have, due to errors in the previous operations. Short washing at this stage is conducive to brilliancy. The plates will keep at least a week if only washed one-half minute, during which time they should be kept in motion under a stream of water. After No 3, let the plates dry thoroughly before using No. 4, and let this again dry perfectly before storage.

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* *The Photographic Times.*

Do not expect the image to flash out as in ordinary negative development; the shadows should appear in from ten to thirty seconds if a suitable temperature is maintained, and the proper density should be obtained within three minutes, and often less. We have practised dipping the plate into a pail of hot water to warm it, and warmed the developer in the same way in a thin glass vessel, and have thus, while securing perfect uniformity of development, worked rapidly and with comfort. One-half ounce of developer at a time should be sufficient for a four by five plate worked in this way.

The character of the enlarged negative for the most part depends upon the positive as regards brilliancy and detail. If the large negative comes up too flat when not overtimed, and requires too much re-development before the proper printing density is obtained, use No. 5 *cold*, with very little No. 6, cautiously, on the *positive*. That will give it the density and brilliancy that it lacks, and which it is essential that it should have, to a certain degree, to produce a good negative.

Print the positives by diffused light. Good contact is essential to secure a sharp positive. Ordinary printing-frames do not give sufficient pressure for large plates; screws are then required. There is little danger of breaking a negative by great pressure if the front glass in the frame is of thick plate, and is so strong as not to yield; but projecting points or grit on either of the contact surfaces are likely to injure the film of the negatives.

A 4-4 portrait lens, with a stop, enlarges well from cabinet portraits. Place front end toward sensitive plate. Cut off all side light, and allow only those rays to pass which go in a direct line through the transparency and lens to plate. For further information see preliminary explanations.

If long parallel cracks are formed in the film, while in No. 3, strengthen the bath with acetic acid, and afterwards with silver if required. When a plate is dipped too rapidly into No. 3, streaks of unequal density are formed, going up from the lower edge. Froth on the surface of No. 3 will also cause streaks, and so will drops of water conveyed on to the lower edge of the plate by wet hands.

The addition to No. 3 of one-tenth of its bulk of alcohol is recommended as a preventive of blisters; also one-grain solution of chloride of gold to reduce the density of an accidentally over-developed transparency. Almost any sample of No. 1 may be made to work by the addition of one-fourth of its bulk of pure alcohol and a few drops of tincture of iodine.

After many trials we find that the No. 1 should be of such quality that, when set, the film may be written upon with a point without tearing up. It is only that made with inferior cotton that requires to be ripened until it gives a milky film. The requisite qualities are consistent with perfect transparency and freedom from reticulation. We have generally made our own cotton, but have recently tried Hance's "Silver Spray" cotton, and find it good. The best cotton will work the day it is made up, in which case use cadmium salts to preserve it in good condition. (Such cotton is best for ordinary negative work.) The sensitizing salts should be thoroughly washed out after No. 1, and this is readily accomplished when using proper cotton. We wash a number at a time in a long trough of running water. The plates should after 3-ing and rubbing, be very nearly like clear glass, and free from mottling or streaks of any kind. The best light you can have for this examination is got by placing a bottle containing a dilute solution of bichromate of potash close up to an argand lamp. Keep the eye out of the direct rays when viewing a plate.

A sample of cotton, right in every other respect, may be useless from its tendency to form blisters; still, when mixed, in proper proportion, with another and otherwise inferior sample, the combination will work well. When all is right, it requires hard rubbing to detach the film at any stage after 3-ing. If blisters form only at 8-ing, soak for a time in a strong solution of salt before washing. An alkaline condition of the No. 8 will favour the production of blisters. It should be neutral.

The symptoms caused by using a horny film are that, after 3-ing, mottling and patches of clearer glass will appear at the corners and edges, and also numerous comets, which appear to arise from specks of dust. These appearances will persist, in spite of every care, until a proper No. 1 is obtained.

Filter No. 2 through cotton, constantly, at the time of using. Frequently add gold to No. 8 as it becomes exhausted, and, while toning, rock the dish at short intervals to prevent mottling.

It is probable that there will be some who are little accustomed to learn practical matters from printed directions. The secret of success is to frequently read over the directions, as you make progress with your work, and you will often be surprised to find some point that you had before over-looked.

THE RETOUCHING OF PORTRAIT NEGATIVES.*

The object of the following lines is to show how far it is desirable to retouch the cliché in order to eliminate or soften certain little defects existing therein, so far as success and the beauty of the portrait itself are concerned, and to consider to what extent the retouching may be carried without interfering with the likeness. In considering the human form divine, it is evident that those parts which require least change or retouching are those which appear most pronounced to the eye, where the bones are prominent, constituting the solid element in the shape of the face. These parts are the forehead, the nose, and the jaws.

The openings of the eyes and of the mouth, the form of the nose, the markings on the forehead, always preserve their proportions, and are the parts which constitute what we call the likeness. A slightly greater or less extension of the muscles of the face, and especially those of the eyebrows, the extreme parts of the mouth, and the position of the lower jaw, determine what we call expression.

In the case of the first two parts it is necessary that the hand of the retoucher should move with extreme caution, for they are the portions which constitute form. As regards the third, one may act with more freedom, especially if it is a matter of getting rid of markings, freckles, &c. It is the surface of the skin that acts photographically, it must be remembered, and forms the tint of the image, and not the parts underneath, which are only rendered by fine shades of light and shadow. Therefore, the main difficulty of the retoucher consists in rendering these lights and shadows of their true value, and suppressing or attenuating the contrasts produced by the colours of the skin.

We will now proceed to give some details as to work, which may be of value, bearing in mind the disposition of the different parts of the face, their change with age, their different appearance according to sex, and their importance in reference to expression and likeness.

The Forehead.—In the child the forehead is round and even; in the man it is divided into several parts clearly recognizable, which constitute the principal expression of his character. The upper part of the forehead is that part of the human head where the skull appears most smooth. The lower part is terminated by the eyebrows, which of themselves constitute a very mobile element in his features. When the model is well lighted, the surfaces of the upper part of the forehead are seen clearly divided from one another, and the retoucher will confine himself to clearing these surfaces, so that they may appear in their entirety.

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* *From Retouche Photographique.*

A forehead that is too round may pass muster in a woman, but it shows to little advantage in a man. The horizontal lines in the forehead, which produce parallel markings, should be softened down. The transversal and perpendicular crosses or wrinkles which appear upon the foreheads of people of an advanced age, and which often produce a bad expression, should be got rid of altogether; or, at the most, only those two crosses should be allowed to remain which take their rise at the root of the nose, and which run towards the top of the forehead, and which turn the horizontal wrinkles from their direction.

At the same time, if the model has raised his eyebrows, the two wrinkles or creases should be softened down in some degree only if the model is accustomed to such an expression, or is somewhat advanced in age.

As regards the hair on the temples and upon the forehead, suppress the eyebrows a bit if they appear too high, and in this way you regulate the form and curve of the forehead. Suppress as much as possible all portions of the eyebrows which appear just above the nose, as this has a tendency to give a scowling appearance, especially if such parts happen to be cast in shadow.

The work of the retoucher, therefore, may be summarised as follows:—To distinguish the plane surfaces of the forehead, to mark the beginning of the hair, to soften or eliminate the perpendicular wrinkles or those of little importance, to preserve the horizontal creases, and to light up the curves of the eyebrows.

It need hardly be said that the retouching must be conducted with judgment, according to the age and sex of the model.

The Nose.—The upper part of the nose is osseous, while the lower part is formed of a stiff muscle more or less long and more or less flat.

In lighting up the point of the nose, this should appear more in relief. Take care that the side of the nose becomes detached, and leaves a half tint upon the diaphragm, which without this precaution appears too large. As a general rule, the nose is not sufficiently accentuated until it is illuminated, and appears in the picture something like a knife-edge. The relief is then well accentuated, and the nose stands out. Sometimes, when the model has a large nose, the light strikes it and makes it appear bigger still without showing the diaphragm; the tone of the print should in this case be heightened upon the side of the nose, and in this way a more correct rendering secured.

Cover either side of the nose with a little shadow, in such a way as to make them look smaller if they appear rather too large in the model. Take care, too, not to allow the shadow in the two nostrils to be absolutely black.

If there is any shadow cast by the nose upon the lower lip, it should be softened down somewhat by the retoucher.

(*To be continued.*)

A PURPLE CYANIDE AS A DYE-STUFF OR PIGMENT.

When cyanide of potassium is added to an acid solution of a copper salt, a red colour is produced, which has already been mentioned by different observers. The substance formed is very changeable, at least in the liquid where it is formed. It is decomposed by acids, alkalies, cyanide of potassium, and even decomposed spontaneously, the colour changing to yellow. It is precipitated by insoluble cyanides; hence when a dilute acid is added to the red solution, the dye is at once thrown down along with the cyanide of copper. If the precipitate thus obtained is treated with sulphuretted hydrogen, it is decomposed, and the substance set free. This substance can combine with iron, like cyanogen, so as to conceal the properties of the iron. This compound is very permanent, and has lately been studied by G. Bong, who gives the following directions for its preparation:—

Cyanide of potassium is added in excess to an acid solution of a copper salt until the red colour at first formed has disappeared, when a ferric salt is at once added. On the addition of the iron salt, of course, a copious precipitation of Prussian blue takes place, and the liquid again turns to a dark purple-red. To separate the colouring substance from the alkaline salts in the liquid, a dilute acid is added, which precipitates it and the cyanide of copper. This precipitate is combined with the Prussian blue, which also contains a considerable quantity of the colouring substance, and then treated with a boiling solution of carbonate of ammonia, in which it dissolves. As the cyanide of copper also goes into solution, it is separated by again precipitating it with an acid, and treating the precipitate with sulphuretted hydrogen. The colouring substance thus liberated now contains a certain amount of hydroferrocyanic acid, which is removed after neutralization by acetate of lead. It is now filtered, and the purification completed by precipitating with a silver salt, and treating the precipitate with sulphuretted hydrogen.

This purple-coloured compound crystallizes very indistinctly. To determine its composition Bong precipitated it with acetate of copper. When dried at 212° Fah., the rose-coloured precipitate had the following composition:—Carbon 24·31, nitrogen 28·04, hydrogen 1·88, iron 13·66, copper 17·67, oxygen 14·44: total, 100·00. These numbers correspond to the formula $Cu, Fe\,Cy_4\,(HO)_4$.

This substance is likewise precipitated by salts of zinc, mercury, and silver. All these precipitates are pink or purple, very beautiful, and of remarkable brilliancy. They are soluble in alkalies. Iron salts yield no precipitate, nor do lead salts, except in the presence of ammonia, when a blue-violet precipitate is formed. When treated with sulphuretted hydrogen, these precipitates yield purple-red and acid liquids, which undergo change in the air, especially if warm, forming Prussian blue. When these liquids are neutralized with alkali, purple compounds are formed, which are permanent in the air, soluble in water, slightly so in alcohol, and insoluble in ether. Their colouring is exceptionally great. These pigments will unite with ferrocyanides, and in its preparation such a compound is produced in considerable quantity; it is likewise of a purple colour, and gives a rose-coloured precipitate with acetate of lead. Both alone and in this compound it is very permanent; it resists the action of sulphurous acid, concentrated and boiling alkalies, and dilute acids, but is rapidly destroyed by chlorine and nitric acid. If this pigment could be prepared cheaply enough, it would probably be used with advantage in the arts, on account of its resistance to chemical reagents and light, the variety of its shades, and its brilliancy. It does not colour fibres directly, but can readily be fixed on them from slightly acid solutions, if they are previously mordanted with metallic oxides.

OLD PRACTICE AND NEW.

BY G. W. WALLACE.*

I used to clean my glass by rubbing with rottenstone and alcohol; I now albumenize all my glass. My formula is about the same as that generally used, and published so many times; but I think that by Mr. Carbutt, in *Mosaics* for 1876, is an improvement on any yet published.

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* *Philadelphia Photographer.*

My bath I used to use 45 and 50 grains strong; I used to precipitate the iodide nearly every week, and was often troubled with the bath working badly, giving blue films and hard cold negatives. Now I never precipitate the iodide any more than what little may occur when making up the bath to its proper strength; then any excess of iodide is precipitated and filtered out; when it does not filter clear, add a few crystals of silver, which will immediately clear it up. I use my bath from 30 to 35 grains strong, and boil when necessary to expel the ether and alcohol. When the bath appears to be foul I neutralize with ammonia, and the application of heat throws down the organic matter. After being made up again and filtered, I acidify slightly with nitric acid, C. P., when it always work well. My collodion I used to make complete at once; the consequence was that my favourite formula would deteriorate before I could use it up, and a lot of old collodion kept accumulating on my hands. Now I make my iodizing solution with ether, alcohol, and excitants, in proper proportions, which will keep indefinitely, and add the cotton to such quantity as I want to use from day to day. I always prefer to add the new to some that is several days old, and by this means keep a nearly equal degree of ripeness in working. New collodion may be used immediately by filtering carefully through cotton, and covering the funnel with a plate of glass to prevent evaporation.

The collodions I use mostly are made as follows:—

Ether and alcohol	Equal parts
Iod. ammonium	5 grs. to oz.
Bro. potassium...	2 ,,
Cotton	6 ,,

This collodion ripens quickly, and will seldom keep in good condition more than a week or ten days; it is therefore better to add the cotton to what is required for use within that time. If bromide of cadmium be used instead of potassium, the collodion will keep much better. I usually add the potassium by dissolving in a small quantity of water, and add to the ether and alcohol solution. The resulting precipitate may be recovered by running the solution through one thickness of filter-paper.

A formula for collodion with much better keeping qualities is as follows:—

Solution the same as before.

Iod. ammonium	3 grs.
Iod. cadmium	2 ,,
Bro. cadmium	2 ,,

The collodions mixed usually produce an article superior to either alone. In warm weather I find that an excess of alcohol is beneficial; about 4 of ether to 6 of alcohol. An advance on my old methods, too, is to keep my bath warm in winter, and my collodion cool in summer.

I used to develop all my plates alike, without noticing how the image was coming up until it was all out and washed; now I watch the development from the beginning to the end, using different strengths of developer, and holding the plate still or rocking it, as the case may require.

I used to make my sittings on light and flashy grounds, with but little attention to the position of the subject, arrangement of accessories (except to get in all I could), or to the disposition of the light. Now I use dark and subdued backgrounds, am very careful in the arrangement of the position, studying every line; use but few accessories, and those judiciously arranged to support or balance the subject; screen and control my light with great care, till I see on my sitter just the effect I desire in the picture. This last point is something that in my early photographic experience I could not do; my eye was not trained to see light and shade. So if any young photographer is not able to see the picture, or the effect he wishes, with the sitter before him, let him not be discouraged, for by patient study and practice this will come to him.

I used to think it of little importance to endeavour to make myself agreeable to sitters—seldom made any attempts to draw one out or induce conversation. The consequence of this was all sorts of moods over which I had no control. Now I study to make my gallery attractive. I meet every sitter as pleasantly as possible, and strive by being social to dispel any reserve they may feel, draw out their individualities, and secure, at the proper time, such an expression as shall be characteristic of them in their most familiar and unassuming moods.

I used to allow as many resittings as were demanded without prepayment, and was often wofully imposed upon, as every photographer has been under similar conditions. Now I require a deposit on all sittings, have done so for more than ten years, and the payment of the full amount when the order is given. I have never found this rule to work to my disadvantage, while I have been sure of getting pay for all I did.

I have referred to the improvements in one department of my work. I had intended to cover the whole, but as my communication is already sufficiently long, I must leave the changes in the printing department till another time, or suggest that it be taken up by some printer who may be better qualified to treat of it than I am.

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ASTRONOMICAL PHOTOGRAPHY.

The facility and precision with which photography represents luminous phenomena in their minute details renders this application of optics more and more important in the sciences of observation, and especially astronomy. But photography could not take a regular place in observatories, unless the photographic apparatus had the same simplicity and theoretical perfection as the instruments used for current observations. M. Cornu states, in a note to the Paris Academy, that, having had occasion to study this problem in connection with the transit observations, and later at the request of the Council of the Paris Observatory, he has found a solution of it as complete as possible. The negatives he had to lay before the Academy would, he trusted, justify this opinion.

It is the peculiarity of this method that it does not require any special instrument, any telescope, and may at once be adopted for photographical observations by means of a purely mechanical arrangement, which does not at all affect the optical qualities of the instrument; the two lenses, which compose the objective, have merely to be separated to an extent depending on the nature of the glasses, but rarely exceeding one and a-half per cent of the focal distance. This operation shortens this distance about six to eight per cent. Theory and experience prove that the original achromatism of the visible rays is transformed into achromatism of the chemical rays, which is necessary to the perfection of photographic images. Direct and precise measurement has shown that this slight separation of the glasses does not cause any aberration in the images.

This method has succeeded perfectly at the Paris Observatory with the large equatorial of the eastern tower, the objective of which is 14·934 inches in aperture, and 29·13 feet in focal distance. By a very simple arrangement the glasses can be separated, and the instrument may be employed for optical as well as for photographic observations. The photographic adjustment does not present any inconvenience in observation of faint stars. M. Cornu states that he easily observed Uranus, and, at least, one of his satellites, without finding it necessary to re-establish optical achromatism.

At the principal focus of this instrument are obtained direct photographic images of the sun and of the moon, measuring nearly 3·42 inches in diameter: images which might be easily magnified by means of the eyepiece, so as to give negatives of more than thirty-nine inches in diameter. The images thus enlarged gain, perhaps, in artistic effect, but they lose in distinctness.—*Scientific American.*

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PHOTO-LITHOGRAPHY.

M. G. **Fortier**, who has acquired some distinction as a successful worker of fatty ink processes, has issued a work on the subject, entitled, *La Photolithographie : son origine, ses procedes, ses applications.* In a great measure it is but a resumé of what has already been published on the subject by Barriswill, Lemercier, Lerebours, Davanne, Poitevin, Asser, James, Toovey, Waterhouse, &c., and we note one strange oversight: M. Fortier still recommends the treatment of the negative which is to serve for photo-lithographic purposes with the old bichloride of mercury intensifier, ignoring altogether the process recently brought forward by MM. Eder and Toth, and to which attention was recently called in these columns by M. Davanne.* The employment of nitrate of lead and red prussiate of potash, as a means of intensifying negatives, is as superior to the bichloride of mercury method, as this is to the ordinary means adopted. The intensity is at least three or four times greater in the case of the new intensifier, and to recommend the old in place of the new cannot be defended for a moment. Let those of our readers who are anxious to prepare dense negatives try the Eder and Toth method, and they will never go back to the old one.

As to obtaining a good gelatine paper upon which to produce the transport, M. Fortier says: "The only indispensable condition is to obtain a film of gelatine neither too thin nor too thick. If thick, it swells too much on the development of the image; if too thin, it does not retain enough greasy ink. Rive paper, such as is usually employed in photography, is very good; a paper rather thicker may be employed with equal advantage.

"There are different methods of gelatining the paper. Upon a perfectly level glass plate is laid a sheet of paper, and at each margin is put a strip of glass to form a tray. The warm gelatine solution is then poured on, and spreads out uniformly; care must be taken to prevent the formation of air-bubbles, but only experience can tell you the thickness and quantity of the gelatine solution employed. The paper may also be prepared by floating upon gelatine maintained at a temperature high enough to keep it liquid. Very highly albumenized and gelatined paper, to be purchased in commerce, may also be employed.

"The gelatined paper is sensitized in a three per cent. bichromate of potash bath in summer, and one of four or five per cent. in winter. The bath must be carefully filtered before use. The sheet need not be immersed bodily into the solution, but floating is sufficient, as in the preparation of albumenized paper. At a high temperature in summer the bichromate solution must be cooled, as otherwise the gelatine partially dissolves from the surface, and the sheet is thus rendered patchy and marbled. Three minutes suffice for the operation of sensitizing, and then the paper is dried; kept in a dark and dry place it will remain good several hours."

Here we may remark that a better plan than this is that recently suggested in our columns, and which consists of employing paper faced with a double film, one of which, the under one, is insoluble in cold water. If, for instance, in preparing the lithographic transport, a gelatined paper is dipped into albumen and then sensitized, or in a mixture of albumen and bichromate of potash, which amounts to the same thing, a print upon this will afford a much better transfer than if the paper had only one coating. Placed under a negative the gelatino-albumen paper is printed, and then inked; immersion in cold water washes away the white surface of the albumen where it has not been affected by light, and leaves in those places a clean gelatine surface unsoiled by ink; the lines of the image have printed right through albumen and gelatine, and stand out black and clear upon the washed gelatined surface.

But to resume. M. Fortier exposes in the ordinary way, getting a well-marked brown image without permitting the light to act upon the lights. The development, he tells us, is one of the most delicate operations of the whole process.

"On coming out of the printing-frame, the print is fixed by means of drawing pins to a smooth drawing board, or, if it is small, it may be held in one hand and inked with the other. Transfer ink is employed for coating the image, and the latter must be very uniformly covered. A roller of gelatine may be employed with advantage. This roller, charged with ink, is passed over the print in such a manner that the latter is thoroughly covered, and then, with the aid of a little ball of soft linen, any excess of ink is removed from the print. The outline of the image should be just visible under the ink.

The gelatined paper, thus printed and covered with ink, is plunged into a bath of cold water. The gelatine which has not been rendered insoluble by the light rays swells up and begins slowly to dissolve. The paper is left in the bath for about a quarter of an hour; in winter it should be transferred to another bath of about 30° Cent.

The paper is now taken from the bath and placed perfectly flat upon a strong glass. The ink is then removed by gentle rubbing with a tuft of cotton wool; great care is necessary not to overdo this part of the operation, as there is a risk of removing the ink from the black lines. The image thus developed should present exactly the same effect as it will give on the stone; all the lines and fine points should be rendered without any failing.

If it is seen that the whole is deficient of vigour, or that some of the lines are not continuous, then the print is pressed between blotting-paper, and the roller again passed over it. The exposed parts will then attract ink, while the moisture in the clear gelatine will repel the transfer ink, as in the case of the lithographic stone. The print must not, however, be too damp, as it will then repel the ink, even in the blacks; in this case the image must be dried a little in the first instance.

If too much ink is applied to the image, the result will be a horny lithograph, for the ink will crush upon the stone, and yield thick lines. The same inconvenience is to be found when the ink is too thick.

The image may also be inked by employing the lithographic press; this method answers very well, but it is rather a long operation.

A well-pumiced stone, rather larger than the paper to be inked, is put into the press, and a roller charged with transfer ink passed over it. A uniform and even coating of ink is in this way obtained. The image upon the gelatined paper is placed face downwards against the stone, and subjected to pressure. If there is not sufficient ink taken up, the stone is inked a second time, and the image again laid upon it. In this way a most uniform layer of ink may be secured."

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* See Technical Notes, Photo. News, Sep. 1st.

When a good transfer has been obtained, the most difficult part of the work is, as any photo-lithographer will tell you, overcome. Given a good transfer, and any lithographer will put it upon stone and pull copies from it. M. Fortier gives very explicit directions as to the further manipulations involved, but these belong to the domain of lithography rather than to that of photography. Many photographers make a mistake in supposing that they need not pay much attention to the lithographic operations, and for this reason frequently fail in producing presentable work; whereas if they had handed over the transfer, so carefully prepared, to a skilled lithographer to proceed with the work, the results would have been very different. No one can succeed thoroughly in photo-lithography unless he is first of all an adept in ordinary lithographic printing.

THE PHOTOGRAPHIC EXHIBITION.

Portraiture is unquestionably the most universally interesting branch of photography, and there are some very fine examples of this branch exhibited amongst the collection now hung in the Old Water Colour Gallery. The excellence is, however, rather that of a high level of commercial work than that higher quality which springs from enthusiasm. We have in former exhibitions been so much accustomed to some superbly fine pictures manifestly prepared with loving care for the annual exhibition to show what might be attained by the art, that the best of the mere "pot-boilers" fail to excite interest and admiration. There are here altogether fewer portraits by first-rate men, and in many instances where first-rate men have exhibited they have not sent examples of their highest quality. In a typical exhibition of the present state of photography, it is sadly disappointing, too, to find no examples of the work of Robinson, or Blanchard, or Marshall Wane, or Abel Lewis, and at least half a score of others amongst English photographers. In few former exhibitions have distinguished foreign artists been absent. Adam-Solomon, Fritz Luckhardt, Bergamasco, Denier, Abdullah Freres, and many others from the Continent, have graced the exhibition with examples of their work. But we have none this year.

Amongst the old contributors of high class work, we are glad to find Mr. Slingsby, of Lincoln, is present; but we should scarcely do him justice if we said that in his contributions he surpassed his former work. His portraiture is always excellent, and, indeed, in a technical sense, perfect. In that respect no fault can be found with his present contributions; but in some we feel some absence of the care for artistic quality which generally distinguishes his work. In (109), for instance, a charming portrait of a fine boy, in a standing position, we have a vast expanse of naked background without object or accessory of any kind, and scarcely relieved by light and shade. Mr. Slingsby has several other portraits, but no subject picture. All are, as we have said, good; but "Ada" (188) is singularly charming. Mr. George Nesbitt, of Bournemouth, ranks very high amongst the portraitists. Until the last year or two an unknown name, his work now ranks with the highest. He contributes nine pictures of large size (16 by 12), all partaking of the character of subject pictures as well as portraits. In all there is considerable artistic feeling evinced in expression, attention to composition, light and shade, tone, and other art qualities. "On Guard" (167) is an exceedingly fine picture: an infant sleeping peacefully in its cradle, whilst stretched by its side is a magnificent mastiff. The pose and expression of the dog are admirable, suggestive of tremendous power in perfect repose, but ready for action at a moment's notice. There is another picture (203) with the same baby and the same mastiff, with the additional figure of mamma contemplating baby, and wondering whom it is like. This is a good picture; but we prefer "On Guard." "How does it go?" (166) a lady with a piece of music in one hand, whilst the other is running over the keys of a piano trying the melody, is also an excellent picture, and tells its story well. These and all Mr. Nesbitt's other pictures are singularly solid and finely modelled; very brilliant and exceedingly delicate. By the way, we may suggest that, whilst a frame of black and gold is generally effective, the broad black margin is almost too funereal for the best effect. There is a very large collection of very admirable portraiture from the studio of the late M. Boucher, of Brighton, fully maintaining the high standard of excellence which distinguished that gentleman's work in his lifetime. Almost every style and size, from cabinet portraits to life-size, are exhibited, and all almost of equal excellence. The work is good in all respects, and they may be taken as types of the utmost elaboration of retouching carried to its highest and most perfect extent, without really injuring the portrait or destroying its photographic value. In the same style is a large number of contributions from Lombardi and Co., many of which are very fine; but many, also, pass into excess of retouching, and become mechanical-looking in texture and modelling. Messrs. W. and A. H. Fry, of Brighton, send some exceedingly good cabinet pictures of figures in fancy costume with very clever scenic backgrounds.

We must defer completing our notice of the portraiture until next week.

DYED BICHROMATE PRINTS.

Amongst the early experiments in producing prints without the salts of silver by the aid of chromic salts, attempts were made to secure dyed or developed images. The image obtained in bichromate gelatine, without any pigment added, was unsatisfactory in colour, and lacked vigour. Various modes of dyeing or colouring the image were attempted. One of the earliest processes, known as the "ink process," was patented over twenty years ago by Mr. J. Perry. The process consisted in preparing paper with gelatine, rendering it sensitive by floating on a solution of bichromate of potash, exposing, and then washing. This gave an image in gelatine and oxide of chromium too pale for any practical purpose. It was next treated with proto-sulphate of iron, washed, and then treated with gallic acid. By this treatment an image in gallate of iron or common writing-ink was obtained. A serious drawback to this process, however, existed. However careful the manipulation and careful the various washings, it was found difficult to submit paper to the action of sulphate of iron and then to that of gallic acid without producing stains and discolouration in the texture of the fabric, so that not only was the image of chromic salt and gelatine dyed with the iron salt, but the paper, which should have remained purely white, was also covered with stains and discolouration. From the difficulty of preventing these defects, the process never became general.

Some years afterwards a most important paper was published by Mons. Emile Kopp, describing an extensive series of photographic experiments with chromic salts, images formed of gelatine, in combination with various forms of these salts, not only serving as mordants to fix various dye colours, but admitting also of treatment with various solutions from which metals were precipitated, and images in various metals produced, giving pictures of various colours—blue, yellow, brown, crimson, black, &c. When treated with dye colours (such as alizarine, Brazil wood, logwood, purpurine, &c.) prints of fine colour with considerable promise of permanency were obtained; but here, again, the old difficulty arose. It was found to be almost impossible to preserve the white paper free from stains and discolouration when submitted to the dye stuff only intended to colour the image, and hence little practical result followed from the possibilities indicated.

Soon after Mr. Swan published his discovery of the key to pigment printing—we mean the plan of printing and developing on one surface and transferring to another—we made a short series of experiments, based upon those of M. Kopp with dyeing materials, and Mr. Swan's mode of transfer. We produced images in gelatine and bichromate, and treated them with a solution of logwood, which gave us pictures of an intense black colour. The stains in the whites were of no consequence now, for the image was transferred to clean paper, leaving all the stains on the paper which had held the image during developing and dyeing. This method gave great promise of good results. Other experiments at the time displaced this method of printing in our attention, and we never carried it out to the issues of which it is, we believe, capable. We commend the principle involved to other experimentalists with bichromate printing.

The process has been recalled to our attention by a communication and some examples of developed bichromate prints from the officer in charge of the Government Survey Office in Madras, whose communication will be found on another page. He has, without being familiar with what has been done, been working out a process in which the image of chromic oxide and gelatine is treated with iron in manner differing somewhat from that patented by Mr. Perry twenty years ago. The prints forwarded have some excellent qualities. The colour is good, being of a rich deep brown tint. They are not so delicate as a good carbon print; but this may be due to the texture of the paper, apparently a somewhat coarse cartridge paper, which has had many processes to undergo; the original coating, exposure, development, dyeing, and various washings. The same mode of working, plus the operations of the double transfer process, would probably give fine results.

A TRIP TO THE HEBRIDES.

BY REUBEN MITCHELL.*

Our stay in Skye was drawing to a close, as we had only a few days more at our disposal. After dinner we had a stroll on the road to Broadford, about three and a half miles, to visit some of the picturesque cottages on the margin of Loch Sligachan. Accidentally meeting one of our Highland guides, he kindly undertook to introduce us to see the interior of these picturesque huts. The first we entered is on the slope of Mount Marscow, a wild desolate looking spot. The inmates consisted of an aged grandmother, the master and mistress of the house, and a stalwart Highland shepherd, with two fine large collie dogs, who growled their disapprobation of our intrusion, but were made quieter by a few kind words. We were kindly offered seats, and soon entered into conversation. Their only occupation appeared, from enquires, to be either shepherds, fishermen, or guides waiting about the hotel for anyone requiring their services. The interior of this cottage is very primitive: a stone at one end of the room, an apology for a fire-grate with the usual chain for suspending the pot, with sundry useful additions in the shape of a hot hob for placing the tea kettle on the bars, also a strong pole across the cottage, and sacking to prevent the smoke spreading in the room. Being anxious to paint an interior, I fixed on this one, if I could get permission to do so. Our guide took us to see another, and by this time it was getting dark; we had three and a half miles to walk to the hotel, but the mail gig coming up we got on, and were soon at home.

The following morning being very fine, we arranged after breakfast to visit our favourite cottage; our party consisted of myself and friend and a German gentleman, with the same guide that had accompanied us on the evening before. On our arrival at the cottage we obtained a very reluctant permission for us to make a water colour sketch of the interior, the gude wife complaining, and wondering, as she stated, what we wanted to paint the inside for, as it was not tidy and done up. I told her it was just what we wanted, and very nice indeed, but she kept fidgeting all the time I remained. I finished my sketch, and introduced the old grandmother and one of the youngsters on her knee, she sitting in the corner all the time, an excellent model. Having finished, I left our German at work, he remaining some time. We exposed several plates, and returned to the hotel for lunch, after which I started to a curious isolated block of rock in Glen Sligachan, about two and a half miles. Having secured this, I returned and exposed my last plate from the bank of the river Sligachan, Scuir-na-Gillean in the distance—a very fine subject. This being Saturday, I had finished just in time for dinner. Our last Sunday was a very wet one.

Before closing my journal at Sligachan, I must acknowledge the kindness and attention we received from the host and hostess of the Sligachan Hotel; every want made known was promptly attended to at reasonable charges and with a liberal supply of provisions. In addition, mine host keeps an extensive wardrobe for such visitors as, arriving in a wet state, can at once be accommodated with dry clothes, causing a good deal of amusement when new arrivals come in drenching wet. We had arranged to leave on the Monday morning, and had an early breakfast, with some sandwiches for lunch on the way; and, having paid our bill and bid our kind friends good-bye, we left this interesting place at seven o'clock a.m. in a two horse car, and arrived at Portree just in time for the railway steamer the *Ferret*, the same we had come over in. We had only just time to get our luggage on board and get our tickets when we were steaming out of the bay on our way to Frome Ferry, and had a very pleasant sail. The steamer called at Rothsay to take in a quantity of bags of wool; one of the sailors was pitched into the sea by the tug rope, but got off with a good ducking in the water. We took the precaution to dine on board the steamer, and it was fortunate we did so, as we intended to take the night train to Inverness. Dinner was only just over when we arrived at Frome Ferry. Our formidable luggage was transferred to the train, as we had not long to wait. The engine being coupled to the train, we were soon rolling along up the same line as we came on, not at the speed we travel in Lancashire, but at a very slow rate, with numerous stoppages, and at last arrived at Inverness about seven o'clock p.m., the night train leaving at 7.35 for Perth. We shall not easily forget the long hours till six a.m. next morning, when we arrived at Perth. After long stoppages and other delays we were very glad to have the luxury of a wash. The Glasgow train coming in we were soon seated, and arrived at Glasgow about 10.30 a.m. We left our luggage at the station, and went to the Windsor Hotel. We had an excellent breakfast, and a few hours' rest, after which we made several calls in the city, and arranged with a friend to spend the following day sailing on the Clyde, so after breakfast we took train to Greenock, arriving in time for the fine steamer *Iona*. A more enjoyable day's trip can hardly be imagined, the beautiful scenery on the sides of the river so varied in character—towns, villages, and mountain-background, with innumerable craft sailing up and down the river. We landed at Tarbart Loch Fine in a pelting shower of rain, and walked on to the village, but the rain spoilt our visit; we were obliged to put in at one of the inns for shelter, the rain continuing, so we went on board the steamer on her return call at the pier, and returned to Glasgow. On the following morning we left Glasgow by the ten o'clock fast train, and arrived safely in Bolton.

Hoping our trip, written from memory since our return, may be of service to others intending to visit the far North, I can commend the island of Skye to such, as there is so much both curious and grand to be seen concentrated in a comparatively small area.

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* Concluded from page 460.

PHOTOGRAPHING THE BABY.

They came at ten a.m.—the baby, his grandmother, his papa and mamma, and two aunties. They wanted to have his picture taken. The obliging artist got everything in readiness, brought out the little velvet-lined high chair in which babies are usually photographed, and then the trouble began. The baby's papa wanted to take off its sacque because it had such pretty fat arms, but its mamma was afraid that it might take cold. Then one auntie thought it would be so sweet to take off his little stockings and sit him in a big arm-chair, but his other auntie thought that such a performance would be very immodest indeed, and a conflict seemed imminent.

Finally it was agreed that they should take the artist's advice, and strap him up in the high chair. After much ringing of bells the baby was induced to look with favour on the new state of affairs. The artist prepared to take the negative, but just at the critical moment the infant doubled himself across the strap and screamed lustily. His papa jingled the bells anew, the artist set the music-box going, while the mamma drew him out of the chair, and his auntie called him a "putzy utzy little sing."

Peace being restored, another negative was taken, this time with tolerable success. But one auntie did not like the expression of the face, and the mamma thought that it did not do justice to his eyes. The next time he stuck both fists into his mouth and shut one eye; and the next time his grandma, who had been watching him intently, ran hastily forward and began shaking him and slapping him on the back.

It was twelve o'clock, and the thermometer stood at ninety-eight degrees in the shade, and that artist ground his teeth, and looked to see how far it was from the window to the sidewalk. Three or four more unsatisfactory attempts were made, and at last the baby, who had been taken out of the chair so many times and was not properly secured, slipped down on the floor with a thump. A grand hubbub followed: everybody screamed; the timid auntie fainted and the papa swore; while the trembling artist, fearing for his life, secreted himself behind a screen in the corner, where he waited until he was sure that no bones were broken, and then he came forth, saying that he had been suddenly called down stairs to see a man.

He was so much relieved on being told that they would not try again that day that he forgot to live up to his rules and demand "pay when the negative is taken." As they started down the stairs the head of the family informed him that they would call again in a few days, and he has hired a small boy to sit at the foot of the steps and bring him word at their approach, so that he may have time to lock the door and hang out a notice—"Gone to the Centennial."—*Omaha Republican.*

TO DRAW AND PAINT MAGIC LANTERN SLIDES.

They are first prepared by having them cut the right size in width and about ten inches in length (they can be bought for a small sum at any glass warehouse); clean them, then lay your picture on a pad of blotting paper, and place your glass over it; the blotting paper will serve as a bed, and the glass will keep the picture in its place ready for tracing the outline, which is done with a camel's hair paint brush, using ivory black, ground up in best drying oil, made thin with a little spirits of turpentine. The best outlines are funny men and women, animals, birds, and grotesque figures, sheets of characters, of clowns, harlequins, &c. When done in outline with the black, they are filled in with the transparent colours, mixed up as the black, only use carmine, gamboge, prussian blue (the more brilliant the colours the better effect they produce); the above being for red. Crimson, yellow, and blue, to form other transparent colours, mix carmine and prussian blue for purple; and lavender, gamboge, and prussian blue for all the shades of green, using for light green more gamboge. Carmine and gamboge make a fine orange colour, and for brown shades mix a little ivory black with carmine or lake, with a little gamboge to temper it. Many other tints are made by mixing the primitive colours first named—red, blue, and yellow—by using less of one colour with another, and if at any time the colours are too thick, thin with turpentine; it works more easy when not too thick, and better transparent.

When all the colours are finished, mix a nice thin black, and fill in carefully all the ground of the glass round the edges of the figures with the black, leaving no part of the glass slide plain. These slides can be made very superior, and to take better care, have them put in small wooden frames, with a tongue at one end to move them in the lantern without the finger touching the glass part. Many beautiful designs can be copied from a kaleidoscope, which when copied and painted on glass slides are very beautiful, and show the colours to advantage. Drawing and painting slides is an instructive amusement, and worthy the attention of all persons connected with youth, as it gives them original ideas for combining colours, and can thus be brought into use for many pretty designs in a pleasing manner.

ALCOHOLIC SOLUTION OF SHELLAC.

BY A. PELTZ.*

The production of a clear alcoholic solution of shellac has been the subject of numerous experiments, but hitherto none has turned out satisfactory except slow filtration. As is known, by digestion of one part of shellac with six or seven parts of 70 per cent. alcohol, a solution is obtained which, when warm, is almost clear, but upon cooling becomes turbid, and is only partially clear after standing a week. The plan of pouring sufficient alcohol over coarsely powdered shellac to form a thin paste yields, upon the addition of more alcohol after the lapse of eight or ten hours, a liquor that does not deposit any more, but which is not clear. Another method suggested, of boiling the alcoholic shellac solution with animal charcoal, gives a clearer liquid, but there is always loss through absorption by the animal charcoal.

The object sought by the author was to obtain a clear alcoholic solution in a short time without much loss. Previous communications upon the substance occurring in shellac to the extent of five per cent., which renders its alcoholic solutions turbid, and is described by some authors as wax, and by others as a fat acid, suggested an attempt to effect its removal before dissolving the shellac. The shellac, therefore, was boiled with water, from one to five per cent. of soda or ammonia being added, but without satisfactory result; a somewhat larger addition of the alkali caused the solution of the shellac. The author next prepared a solution with one part of shellac and six parts of 90 per cent. alcohol at the ordinary temperature, which was effected with frequent shaking in ten or twelve hours. To this he added carbonate of magnesia to about half the weight of the shellac used, and heated the mixture to 140° Fah. The solution so obtained cleared more rapidly than a solution to which magnesia had not been added, and filtered in less time; but it did not supply what was sought. When powdered chalk was substituted for magnesia, the solution, after standing some hours, became three-fourths clear, while the lower turbid portion could be rapidly filtered. It only required a little alcohol to wash the filter, and a clear alcoholic solution of shellac was obtained. Further experiments—for instance, with sulphate of baryta—did not give a better result. When such a solution is made on a large scale it would be best filtered through felt.

Notwithstanding that the object of the author had thus been attained, one or two other experiments were tried. To three parts of the above mentioned shellac solution, one part of petroleum ether was added, and the mixture was vigorously shaken. After standing a few moments the liquid separated in two layers; the upper light coloured layer was the petroleum ether with the wax dissolved in it, the lower yellow brown layer was a clear solution of shellac with only a little petroleum ether adhering. Upon allowing the petroleum ether to evaporate spontaneously, the wax that had been dissolved out of the shellac was obtained as a white residuum. By using alcohol at 95 per cent. to dissolve the shellac, and then adding petroleum ether, a perfectly clear solution was obtained that only separated into two layers after water was added. Consequently an alcohol weaker than 90 per cent. should be used.

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* *Pharmaceutische Zeitschrift fur Russland.*

The shellac solution obtained by means of petroleum ether, however, has the advantage that the shellac is left, after evaporation, in a coarser form, and easily separates; this may be obviated by adding one to three per cent. of Venice turpentine.

Correspondence.

CLEANING THE FINGERS.

Dear Sir,—A good deal has been written of late on the subject of cleansing the hands from the dirty-looking stains of nitrate of silver. Every one agrees that cyanide of potassium is a most dangerous remedy; but still they go on using it for want of something better. Talking to a friend, a photographic printer, the other day, on this subject, he remarked to me that he had used cyanide for several years without experiencing any ill-effects from it; but that he knew a fellow-printer who was laid up with ulcerated and half-paralyzed hands, through getting it into some breaks and chaps which he had on them. I advised my friend to stop using cyanide, and try a solution of chloride of lime; or to rub his hands vigorously with pumice-stone after washing, both of which methods I have found simple, and tolerably effectual. He said he would try them, as he had no wish to be laid up like his friend.

As a rule, the parts of the hand which absorb most silver nitrate are the nails. The following simple method I have found cleanse them perfectly:—After washing, dip a damp rag in *common whitening*, and rub the nails well with it. That is all.

Trusting this may be of service to your readers,—I am, sir, yours sincerely, C. E. Grosvenor.

DEVELOPED GELATINE PRINTS.

Survey Office, Chepauk, Madras.

Sir,—I find that developed bichromate prints give very good results, and I have been using them instead of silver prints to some extent in this office. For line work the process answers very well, and I think good and pleasant pictures should be obtained in half tones. I enclose two prints in half tone, from which you will see that further modifications are necessary in the developing solutions. One of my difficulties has been to get a good tough paper; in this I have not yet succeeded, but shall have some in the course of a week or two, when I hope to be able to turn out better work.

In case you may think the process worth publishing, I send you my mode of coating.

Coat paper with seluline twice, taking care to reverse the ends of the coated paper on first and second drying. When dry, float on bichromate of potash. The time for floating of course varies according to temperature. In this climate (85° to 90° temperature) I find from one minute to one and a half sufficient.

When the paper is dry, expose under a negative and print well; take into the dark room, remove print, and immerse it in warm water till all bichromate has disappeared; rinse the print in clean cold water to remove all traces of bichromate, and to prevent the gelatine swelling too much and covering up the fine work. Then develop with citric acid, glacial acetic acid, pyrogallic acid, and protosulphate of iron, till the picture comes up well; wash thoroughly, develop again with gallic acid and chloride of ammonia; immerse in warm water till all superfluous gelatine has left. When the lights are sufficiently clear, hang up to dry. The print can be intensified, after drying, by re-developing with gallic. If you can inform me whether any good results have been got by this method, and what is the *modus operandi*, I shall be much obliged. The process is new to me.

Developer used by me.

No. 1.—	Prot. iron	20 grains
	Glacial acetic acid	20 minims
	Pyrogallic acid	2 grains
	Citric acid	4 ,,
	Water	2 ounces
	Alcohol	
No. 2.—	Gallic acid sat. solution ...	1 ounce
	Chloride ammonia	1½ grains
	(acccording to time required).	

This style of printing should work far better in England than here, as the heat of this country is against working with gelatine.—I am, yours faithfully, C. C. S.,

In Charge Photography and Mapping.

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

Sir,—I so thoroughly sympathize with the earnest and high-toned letter of "A Country Photographer" that I feel considerable reluctance in pointing out a somewhat important error into which he has fallen. He enumerates a certain number of "old exhibitors of any consequence," and challenges the citation of another name. I feel sure it is inadvertence, and not intentional slight, which makes him omit from his list of old contributors of consequence such names as the following:—Bool, Dunmore, Gillard, Grant, Baynham Jones, Reuben Mitchell, Mr. and Mrs. Payne, W. D. Sanderson, A. Ford Smith, B. Wyles, J. M. Young, and several others, whose work is always good, some of them superb. With this doubtless unintentional omission, I think every one must feel with your correspondent. A Country Amateur.

Dear Sir,—Will you oblige me by inserting this letter in your next issue of the Photographic News, as it has reference to an article under the heading of "Correspondence" in the News of September 29th, signed "A Country Photographer."

He commences his review by condemning both the management and everything connected with the Photographic Society of Great Britain; also showing his want of courtesy to his inferior brethren in the art by telling them that the only old exhibitors of any consequence, excepting those who exhibit for trade purposes, are reduced to the very small number of ten, challenging the addition of another name to the list. Could he not have added his own? as his profound knowledge and indisputable judgment might be of great value if the name of this Ulysses in art were known, so that those out of the pale of his notice might look up to him for advice, in order that the next time he visits the London exhibition some more names might be added to his list of worthy exhibitors.

I would suggest to "A Country Photographer" in London, when he returns home, to look up his list of old proverbs, and see if he has one which states that truly great men are unassuming and humble, and not like "Country Photographer," sounding his own loud trumpet, and telling the craft, through the Photographic News, that he has been to London to see the exhibition, and found it wanting, and promising to be an ignominious failure. What a serious state of things! Will no one come to the rescue? Perhaps "Country Photographer," as a profound judge of art photography, might save the Society from total disgrace and wreck! Could he not be prevailed on to give his valuable advice and go over the exhibits of both old and new exhibitors, and point out the defects, also tell us where to amend our work, if he really has at heart the interest of the Society and the good of the craft? But I may tell him it could hardly be expected that many could possibly come up to his standard of excellence; but as he suggests nothing, his observations amount to chaff only.

Another Country Photographer.

SPOTTY PRINTS.

Sir,—I have read with great interest the various letters that have appeared, and still are appearing, in your journal, relative to the cause of spotty photographs; but in spite of the many apparently lucid theories advocated, I must, from actual practical experience, beg to differ from them all. To my mind, the most likely cause set forth was gold printing, and I was induced to hope it was an established one; but actual facts which have lately come under my notice have disproved the theory *in toto*. For instance, how comes it to pass, if the theory of gold printing is to be believed, that in one and the same album some of the photographs executed only a year ago are spotty, while others mounted on precisely similar cards (all gold printing) taken years before, are literally "without spot or blemish"? And this is not a single instance by a long way. We have the same "proof" forced upon our notice almost daily. People bring back cartes, or complain of others being spotty all over, while we find others, taken at the same time and under precisely the same circumstances, are perfectly free. Further, it is so in our own albums and sorting box: some "go," and others don't, yet all are mounted on gold printed cards, and with the same material. Now, sir, I contend, that if it is the gold—or, more correctly speaking, bronze—printing that is the cause of our prints going spotty, they must all go, and not merely a part. Lying in an album, all the cartes come under the same atmospheric influence; therefore, how is it? It cannot be even damp acting on the gold, otherwise all the photographs in the album mounted on gilt cards would be equally affected. Surely, sir, this great and inexplicable mystery has yet to be solved. Can any of your readers throw further light on this very dark subject? If so, I for one shall feel truly grateful. Now that the subject has been thoroughly mooted and taken up, I don't think we ought to let it drop till a "perfect cure" has been established.—Yours truly, Snowstorm.

KEEPING COFFEE PLATES DRY.

Dear Sir,—In reply to "F. M. Y.," I would say that I think the difficulty of dampness with the coffee-dry plates, of which he complains, is simply due to the condensation of moisture from the atmosphere, caused by a considerable difference of temperature in the *box* in which they are stored, and the *room* in which that box may be opened.

I have occasionally noticed the same thing, and in such cases pass the plates a few times over a spirit lamp, if I wish to use them at once, or otherwise allow them to remain in the slides for half an hour or so before exposing. I, in fact, almost invariably do the latter.

After preparing the plates, I allow them to dry spontaneously, for this purpose standing them, upon edge, resting against pegs, in an ordinary box, with two thicknesses of blotting-paper at bottom, and carefully cover the front with a piece of thin yellow calico, to exclude dust. When dry, I place them in any convenient box, of wood or paper, and pay no further attention to them. For travelling, I pack in parcels of ten or twelve each, placing a piece of bent cardboard between the plates, at each end, to prevent the surfaces touching, and then wrap in a piece of American cloth or mackintosh. With no other precaution I have kept them in perfect condition for fourteen months, during which time they made two voyages across the Atlantic.

I have little or no doubt that "F. M. Y's" difficulty proceeds from the cause, and will disappear by adopting the means, I have suggested.

I need hardly assure you that it will, at all times, afford me pleasure to give any further information in my power. All the manipulations, and everything appertaining to the preparation, of these plates are so simple, and the results are so uniform and satisfactory, that I am convinced "F. M. Y." must succeed, and will be delighted with them. My own album appears to elicit such general admiration that I am certain that the process in more experienced hands would leave nothing to be desired.—Yours truly, J. H. W.

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The usual monthly meeting of the Association was held on Tuesday evening, the 28th ult., at the Free Library, the President, Mr. W. Atkins, in the chair.

The minutes of the previous meeting were read and confirmed.

The Rev. H. J. Palmer then read a paper on "Further Experiences with Gelatine Emulsions." The paper was illustrated by a number of most excellent negatives taken for the purpose, and also by a quantity of negatives taken by Mr. Palmer on the Continent during the summer. The whole of these negatives were of such a superior character that the attention of the members was at once attracted, and at the close of the paper several members expressed their desire to work a process which gave such satisfactory results.

A discussion followed on the causes and means of avoiding the blistering of gelatine films. Mr. Palmer could not give the analyses of the "Hunyadi" Janos water which had so good an effect on his plates; but Mr. Wharmby suggested that it might be similar to Epsom salts, which had been also recommended to avoid blistering. A vote of thanks to Mr. Palmer was passed unanimously.

Mr. W. Horsman Kirkby showed some prints taken on wet emulsion plates coated with albumen, which he preferred to wet collodion, being equally rapid, and not so liable to quick drying, in case of their not being brought into use for an hour or two. Mr. Kirkby also showed some good examples of double printing by painting over the portrait previous to printing in the background, and afterwards washing off the colour before toning.

A number of prints were exhibited, being the work of Messrs. Forrest, King, &c., &c., and several pictures were presented for the Society's album by Messrs. Kirkby and Forrest.

Mr. J. H. T. Ellerbeck and the Secretary presented a number of lantern transparencies for the use of the members.

An improved form of sciopticon lantern was exhibited, but the trial between it and the old form of sciopticon was postponed until a future meeting.

The presentation prints were then distributed, and the meeting shortly afterwards was adjourned.

Talk in the Studio.

A Valuable Negative.—At the recent sale of the effects of Mr. Charles Watkins, the well-known photographer of Parliament Street, we learn that the negative, with copyright, of H.R.H. the Prince of Wales in Grand Masonic Regalia, was knocked down, after eager competition, to Messrs. Marion and Co., of Soho Square, at the handsome price of £185, the largest sum, we believe, ever paid for any single plate of this *genre*.

Printing-in Clouds.—At a recent meeting of the Vienna Society Herr Migurski described the method generally used by Russian landscape photographers for taking natural clouds, and by which good results are said to be much more easily attained than either by printing-in cloud effects separately obtained, or by painting them in when retouching the negative. Herr Migurski says that in Russia most landscape cameras are constructed upon the stereoscopic principle. A view is first taken with a short exposure, by means of which a sort of outline of the landscape and clouds is obtained; a second plate is then exposed the full time, in order to secure all the details of the landscape. The sky can then be easily printed from the first negative.

Enlargements Without Apparatus.—A German writer states that in Paris and Brussels we see sometimes portraits taken at full size (large as life), which are reported to be copied from a carte-de-visite. By occasion he made the acquaintance of the artist, who lives in Paris, and whom he visited at his studio. There stands an easel-piece, and the secret reveals itself by seeing him at work. The carte-de-visite is fastened by a holder in front, at which he is looking through a loop before his left eye, while his right hand is drawing the outlines of the picture on the cartoon by means of a crayon. It shows that the portraits are not done in a photographic way, but by drawing. The most interesting is how he produces the shading and half-tones, shading by rubbing with the little finger a drawn crayon mark (line) so skilfully that in a moment we see appear the most handsomely toned surface on the cartoon. The picture resembles so much a handsome photograph that even men of the profession are astonished when told how it is done. By means of this method we advance so far that retouch and hand-drawing make the photographic apparatus superfluous. And that this method satisfies the public is shown by the price of the portraits—namely, 250 to 300 francs in Paris, and 400 to 500 for customers in foreign countries. Similar enlargements are produced by E. Sellbach, at Antwerp.—*Photographic Times.*

Standard Paper for Actinometer.—The Editor of *Anthony's Bulletin*, speaking on the sensitive albumonized paper for use in the actinometer for timing exposure of carbon prints, says:—"As it is best to have it freshly prepared, we give the formula for it, viz.:—Silver 60 grains, citric acid 2 grains, water 1 ounce. Float one minute."

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To Correspondents.

G. V. W.—Your question "What is the office of a preservative in the dry plate process?" would require a long essay to answer it fully. In the first place we may state that the same office is not performed by all preservatives. Some act a mechanical part, and some a chemical part; and there is divergence of opinion as to the precise character of the mechanical part. An early theory on the subject was, that the chief office of the preservative was to fill up, and so preserve from complete contraction and closing up, the pores in the sensitized film of collodion. Thus: a sensitized collodion film was coated whilst it was wet with a solution of gelatine or starch, which, permeating the absorbent film, and after the plate was dried and exposed, left the plate in a condition in which it was easily soaked and softened with water for development; whereas if it had not been so coated, the collodion would have dried up into a horny film not easily softened with water. Another theory of the mechanical action is, that the preservative acts as a varnish, preserving the film from air, moisture, &c. In the chemical theory, which is doubtless the correct one as applied to some processes, the principle is recognized that the haloid salts of silver are much more sensitive when associated with an organic salt of silver, which is furnished in the preservative, without which a weak, poor image, or none at all, would be obtained. This theory involves other considerations, into which we cannot enter here. Some samples of collodion will give a plate in which simple washing and drying the sensitive plate will serve to give satisfactory results; but, as a rule, only those samples of collodion which give a spongy film, and then only when bromides as well as iodides are present.

Constant Reader (Amateur).—The prints you enclose are excellent. The untouched one is so good that it scarcely needed retouching.

Little Harry.—You have not read the formula carefully. It gives full details of the iodizing. Read again, and you will find that iodide of ammonium and iodide and bromide of cadmium are used, the iodizing being thus done at the time of making the collodion.

A. B. X.—We could have advised you better if you had given us a list of the lenses you thought of, each with a number attached. A good view lens may be used; but some other of the recently improved lenses would give good results much more rapidly. We cannot, however, with propriety, mention them by name.

J. E. D.—Black varnish may generally be removed from the back of a glass positive by applying benzole, or mineral naptha, or even turpentine; or it may be scraped off carefully with a knife.

E. R. Day.—If you read the announcement carefully you will find that £30 is the charge to professional photographers, not simply for the use of the autotype patents, but for several more recent patents which the Company have bought. The arrangements for amateurs involve the expenditure of a mere trifle. If you write to the Company you will obtain full details.

S. W. Oates.—The cards were duly received and acknowledged, but the copy never reached the printer, having been lost in the post. It has just been found. Here is what we said:—"We are glad to learn that the step we advised a few years ago has been satisfactory and successful. The cards you enclose are all very creditable work indeed, especially so under the circumstances. You do not need retouching much with card pictures, so long as you get as much delicacy and modelling as your pictures exhibit." As regards your present question, you need not, for the enlargements you require, reverse the lens.

T. B. C.—We have not had much practical experience in etching on glass; but we always used fluoric acid, applied in a fluid state if the pattern were merely to be incised and remain bright, and in the form of vapour if we required the etched pattern to have a matt surface. The article to which you refer is a translation, as you will see. If we tried it, we should dissolve the crystals in dilute acetic acid, which will disengage vapours of fluoric acid, and those would be the active agent in etching the glass.

C. Carter.—For most purposes, a swing-front will answer as well as a swing-back; although, perhaps, not quite for all. Probably, it will answer your purpose quite as well.

G. F. Dew.—Thanks. We regret the error.

B. Wyles.—Many thanks. We will write.

Erratum.—In our notice of landscapes at the exhibition last week, a picture (No. 11) was erroneously attributed to Mr. G. F. Dew, which should have been attributed to Mr. G. Mansfield.

Captain Waterhouse.—Received just as we were going to press. Many thanks. In our next.

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METEOROLOGICAL REPORT FOR AUGUST.

BY WILLIAM HENRY WATSON, F.C.S., F.M.S.

Observations taken at Braystones, near Whitehaven,
36 *feet above sea-level.*

N.B.—The observations given in this and former reports of the temperature were taken in the shade, and the readings of the barometric pressure have not been reduced to sea-level.

Date.	Barometric Pressure.			Temperature			REMARKS.
	Morning	Noon.	Night.	Morning	Noon.	Night.	
1	29·51	29·60	29·72	53·5	57°	56°	Showers a.m. and p.m.
2	29·72	29·62	29·41	58°	60	57	Rain all day. Very strong wind at night
3	29·54	29·60	29·64	60	61	59	Showers a.m. and p.m.
4	29·68	29·73	29·79	60	62	59	Fair, but cloudy
5	29·92	29·95	30·02	59	65	60·5	Fair and sunny
6	29·99	29·97	29·91	62	66·5	57	Rain commenced about one o'clock
7	29·91	29·92	29·94	62	65	60·5	Fair, but dark
8	—	—	29·99	64·5	—	—	Fair, but gloomy
9	29·91	29·88	29·99	60	60	59	Rain morning and afternoon
10	30·01	30·07	30·10	59	64	55	Fair and sunny
11	30·13	30·16	30·11	62	68	58	Fair and sunny
12	30·08	30·08	29·95	65	74	63	Fair and sunny, but hazy
13	29·86	29·81	29·80	73	78	65·5	Fair and sunny. Hazy
14	22·80	29·80	29·82	68	78	64	Fair and sunny. Very foggy this evening
15	29·83	29·88	29·89	68	76	61	Fair and sunny
16	29·89	—	29·87	72	80	71	Rain early this morning, with thunder and lightning. Sunny rest of the day
17	29·84	29·80	29·79	70·5	80	74	Fair and sunny. Windy at night
18	29·81	29·81	29·89	74	81	—	Windy. A few drops of rain at night
19	29·86	29·85	29·80	71	75	68	Fair and sunny. Distant thunder
20	29·75	29·70	29·74	76	82	66·5	Fair, sunny, and clear
21	29·71	29·71	29·74	70	74	62	Fair, generally sunny
22	29·77	29·80	29·82	59	62	54	Fair and sunny. Windy
23	29·76	29·74	29·72	59	—	53	Fair and sunny
24	29·60	29·58	29·60	54	54	46	Showers p.m. Distant thunder
25	29·67	29·71	29·75	54	57	54	Fair, but gloomy
26	29·70	29·63	29·40	54	59	57	A little rain this afternoon
27	29·37	29·38	29·55	53	57	58	Showers a.m. and p.m.
28	29·60	29·58	29·50	55	59	56	Rain a.m. and p.m. Windy
29	29·40	29·34	29·33	52	56	56	Rain a.m. and p.m.
30	29·40	29·25	29·00	54	60	54	Rain morning and evening
31	28·97	28·96	28·92	53	55	53	Rain a.m. and p.m.

Summary.	Mornings.	Noons.	Nights.
Highest temperature observed	76°	82°	74°
Lowest ditto	52	54	46
Mean ditto	62·1+	66+	58·4+
Mean of all observations	62·2		

Number of days on which rain fell	14
Number of fair days	17
Number of fair days bright	13
Number of fair days gloomy	4

Notes.—Comparing the above with the observations made in August, 1875, we find that although the highest temperature recorded in August this year has been very much higher than in the corresponding month last year, yet the mean temperatures are only slightly different in the two months. So that a comparison may be made, I give below the summary of my observations in August, 1875, as published.

Temperature.

1875	Highest.			Lowest.			Mean.		
	Morns	Noons	Nights	Morns	Noons	Nights	Morns	Noons	Nights
August	65°	73	65	56	60	55	59·8	64·6	60·3

Braystones, near Whitehaven, September 12, 1876.

The Photographic News, October 13, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Story of a Life.

The Story of a Life.—At the foot of the Jura mountains lies an old grey cathedral of France, the gaunt buildings of which are washed by the swift-flowing Saône. The city is called Chalons-sur-Saône, and in it was born, during the latter half of the past century, Joseph Nicèphore, the third son of Claude Niépce. Originally trained for the Church, Nicéphore received a sound and liberal education, and which subsequently stood him in good stead during the latter portion of his eventful life. The studious youth grew into a promising young man, but before the time of his ordination arrived, the mighty French revolution swept like a tempest through the length and breadth of the land, and made itself felt as well in Paris as in the quiet provincial cities whose normal state of solemnency is so rarely disturbed. Without hesitation, Nicéphore elected to wield the sword in place of embracing priesthood, and in a short time received a commission in the army as second lieutenant, one of his elder brothers, Claude, entering the navy about the same time. He was despatched to Sardinia, where his ability and learning soon earned for him an appointment on the staff. Subsequently, his military duties took him to Nice, and here a stubborn sickness with which he was seized bid fair to rob France of producing the first practical photographer. Fortunately for Nicephore, a Samaritan in the form of one Madame Romero found the poor fellow stretched upon his bed of sickness, and, aided by her daughter Agnes, she nursed the young lieutenant through his grave illness.

And now comes in a little bit of sentiment, as, indeed, should be the case in such a story as we are telling. The young man, as a matter of course, fell deeply in love with his youthful nurse. She had saved his life, and he now, in a chivalric spirit, laid it at her feet. Madame Romero could not wish otherwise than to see her daughter and the man she had treated as her own son happy together, and in the end Agnes and Nicephore married. Their means, it appears, were not great, and, to make matters worse, the young soldier's eyesight began to fail. He was never very strong after his attack, and, to save himself from being prostrated a second time, he was compelled reluctantly to throw up his commission.

He was fortunate enough to secure a public appointment in Nice, which left him much spare time for private work and experiment. He had been noted from a boy for ingenuity and ability in contriving mechanical apparatus, and when he settled down into private life he determined to see if he could not earn his bread as an inventor or improver in some branch of mechanics. His brother Claude, who had quitted the navy about the same time that Nicephore gave up soldiering, joined his brother at this period. They worked together in many directions, their two main efforts being directed, however, in the perfection of a hand-carriage or velocipede, and in the prosecution of lithographic experiments, for Senefelder had about this time made known his first results in printing from stone.

From lithography to heliography—or photography, as we generally term it—is but a step, and the two brothers tried their hardest in seeking to secure upon stone designs by the mere action of light, or, in other words, to render shadows permanent. We hear for the first time now of optical experiments, and a desire to fix by the aid of chemical agents images reflected upon a surface. All sorts of bleaching and changeable chemicals were had resort to, but without success, and while the two brothers continued assiduously their labours, poverty, amounting almost to beggary, overtook them. They were living at this time (1816) at St. Loup de Varennes, and a serious council was held between the brothers as to how they should act. Claude, it was decided, should proceed to England, in order, if possible, to effect the sale of the velocipede they had invented, for our country, it seems, has long enjoyed the reputation of a desire to help on inventors and discoverers, and especially those touching on mechanics. Claude accordingly departed with his pyreotophore, as it had been christened, while Nicephore remained at home, determined upon pushing on his experiments with "light printing."

We now come to Nicephore's first great success, and it is fortunate, indeed, for us that the brothers were separated, as we thereby come into possession of a vast number of letters written by Nicephore to England, which detail step by step the progress he made. In the spring of 1816 we hear for the first time that he has constructed a camera, a tiny box fitted with a simple eye-piece, in which he sees images reflected upside down, "a kind of artificial eye," as he naively describes it. He had already, seemingly, obtained means of getting outlines printed upon paper by light, for we hear soon afterwards that he has put paper thus prepared into the camera, and obtained dark places where the sunlight has acted inside the camera. He tells his brother that he cannot help getting the lights and shadows reversed, and thinks the only way to secure ultimate success will be by discovering a dark paper that will bleach white, and not by the aid of white paper which becomes impressed with shadows. There seems little doubt that it is paper saturated with salts of silver that he employed, as otherwise he would not have obtained pictures so quickly as he did.

The first photographs ever taken by optical means in a camera were undoubtedly those obtained by Nicephore in May, 1816, and which are so accurately described in a letter on the 28th of that month to his brother, that we can realise them as well as if they were now before us. On that date he sent his brother four pictures, which were white on a black ground. It was an old familiar object that he had photographed, a barn and pigeon-house, with a pear tree overhanging the roof. "The white mass," he tells his brother, "which you perceive to the right of the pigeon-house, and which appears somewhat confused, is the reflection upon the paper of the pear tree, which is some distance further off, and the black spot near the summit is an opening between the branches of the trees. The shadow on the right indicates the roof of the bake-house;" and, for fear his brother might not altogether recognize it, he explains that it is somewhat lower than it ought to be, "because the cameras were placed about five feet above the floor." Then he refers to some "white lines" which mark "the branches of some trees in the orchard."

We shall not dwell any longer upon these and other letters, as they have already been published in these columns. In 1820 we find the first mention in the Niepce correspondence of bitumen of Judea; and in 1823 and 1825 we hear of photographs on metal plates produced from engravings, two of which—"a landscape" and "Christ Bearing His Cross"—are still to be seen in the museum of his native town of Chalôns. It was one of this series which was shown to Chevallier, the renowned Paris optician, by a relative, Colonel Niepce, and which led afterwards to the introduction of Nicephore to Daguerre.

In 1827 Nicephore came to England to see his brother Claude, from whom he had been separated many years. Claude was ill and broken down in health, his sickness no doubt being caused in some measure by the ill-success that had attended the sale of his invention, and it was on his way through Paris to join his brother that the first meeting between Daguerre and himself took place. He arrived in time to see Claude, who, however, died shortly afterwards, and Nicephore remained living at Kew for some time, hoping to get the Royal Society to patronize him or his invention. A picture of Kew Church which he took about this time, and which is still to be seen in the British Museum, has become historical. When the poor French philosopher was dead, and his name almost forgotten, that picture was the means of reviving his good name. Daguerre's memoir read in 1839, publishing to the world a method of light-printing, contained no mention of his old partner, Nicephore Niepce; but when the tidings reached this country, and specimens were handed about, Faraday bethought himself of a foreigner in distressed circumstances who years ago had brought him a picture of Kew Church, with the unintelligible explanation that "the light did it." Faraday at once communicated what he knew to the Royal Society, and the Kew Church picture was put in as evidence, the Secretary of the Society, Mr. Francis Bauer, representing the matter most strongly to the *Academie* of Paris. So successful were his efforts that in the end a pension was awarded, as we all know, to the son of Niepce, at the same time that another was given to Daguerre.

Nicephore Niepce died on the 5th July, 1833, in his sixty-ninth year, profoundly impressed, as his brother Claude had been, with the soundness of his invention. It was this conviction, probably, more than anything else, that prevented him from dying a disappointed man. The whole of the information he had earned in his lifetime he parted with to Daguerre, but the compact between them prevented him from publishing at his death how much he actually elaborated in the process of photography beyond what can be gathered from his letters and from the deed of agreement. We shall never learn what share in the Daguerreotype invention was his, therefore, but still we know enough of the philosopher humbly buried at St. Loup de Varennes to award him the first place among early photographers.

FRENCH CORRESPONDENCE.

Le Verrier's Solar Researches—M. Janssen at Work Again—Photographs of Birmah—Jules Girard's Micro-Photographic Researches—The Cause of Fog in Negatives.

Our scientific men have been much occupied for some weeks past upon a question in which photography plays a most important rôle. It is in respect to certain spots upon the solar orb which observers in different countries have perceived since 1720, and which result from the passage during that period of one of the planets revolving between Mercury and the Sun.

M. Le Verrier, who is making a profound study of the documents which are in existence upon the subject, and who from week to week entertains the Academy of Science with the results of his labours, has not been able as yet to recognize in a decisive manner whether the observations in question relate really to a planetary body whose outline is projected against the solar orb, or whether these spots are produced in a transitory manner upon the sun. Whichever solution may be the correct one, the celebrated astronomer has adopted in the first place the former hypothesis, and has therefore set about making a series of calculations by the aid of which he has found out that if they are intra-mercurial planets they will reappear in the first days of this October. He has for this reason earnestly recommended that all his comrades should watch the solar disc very carefully during the present fortnight.

Now, as M. Janssen said very truly at the last meeting of the Academy, the most simple means, as well as the most certain one, of observing what takes place upon the sun during this period is to photograph the same, not only, however, every day, but hour by hour. Whatever may be the phenomena produced, a series of photographs secured under precisely the same conditions would permit one to examine such phenomena much better than with the eye, and, moreover, the records would be free from any of those illusions which are so inherent to ocular observations.

M. Janssen has undertaken the work of photography with all the zeal and skill which characterize him. Some time ago, it may be remembered, I spoke of the observatory which the eminent astronomer has erected in Paris, on the Butte Montmartre. I have said that, thanks to the special instruments which he possesses at that establishment, the sun's image is photographed every day, and I told of the clichés which I saw produced under my own eyes. At every hour of the day from this month forth pictures will be taken, and during the present week, indeed, the camera will be brought into requisition every five-and-twenty minutes. The pictures at first measured but ten centimetres in diameter, but at the present moment their size is not less than fifty-seven centimetres, and they are so clear that with the aid of a magnifier it is possible to discover a whole multitude of precious details. Therefore, under these circumstances, it seems clear that it will not be difficult to decide whether the phenomena under discussion are produced by planetary bodies or not.

As it would be impossible almost to expect an operator to remain at his post by the apparatus from daybreak to night, no matter how enthusiastic he might be, M. Janssen has availed himself of his chair *revolver* to get out of the difficulty, an apparatus which, as our readers are aware, has already found many useful applications. I may remind my readers that in this apparatus the sensitive plates succeed one another automatically, and come round of themselves to their proper places in the camera. It is only necessary, therefore, to charge the instrument with dry plates, which are afterwards taken out and developed at the end of the day.

It is thus highly probable that photography will be able to come forward and satisfactorily solve a problem to which very high scientific interest is at present attached.

I cannot resist the inclination to call attention to a magnificent collection of views which M. Janssen has been good enough to show me in the course of a visit which I paid him, on Wednesday last, to seek information upon the points to which I have just alluded. The collection is one of views taken in Birmah, which have just been forwarded to him by an English photographer. This strange country seems so full of wonders that it calls to mind old fairy tales. The immense palaces depicted in these pictures might be the magic castles which were always guarded by dragons, except that here the dragons are of marble or granite, and of immense proportions. Of the ships, that of the king is so laden with idols that it might be taken for a floating temple; while one sacred town, near the Ava, the seat of the government, is composed entirely of pagodas to the number of five thousand. Quite a world of extraordinary objects is here for the eyes of a European. No doubt this interesting collection is already known in England; here it will certainly make a great sensation among the public.

M. Jules Girard, whose name I have often mentioned in this correspondence, has just presented to the Academy of Sciences a note under the title of "Photo-micrographic researches upon the reduction of silver salts in photographic images." The principal points of this work are as follow:—When a negative cliché is examined with a low magnifying power, whether the same has been developed by sulphate of iron or pyrogallic acid, there may be observed in the clear and untouched portions crystals, uniformly distributed, and scarcely one-hundreth of a millimetre. These crystals of reduced iodide of silver, which are sometimes very abundant, constitute the *fog* which photographers fear so much in their productions. These crystals spread sometimes right over the sensitive film like a cloud that is impenetrable by light.

The effects produced in the sensitive film appear to be quite distinct from this superficial reduction. In examining the blacks, or portions acted upon by light, through a series of progressive tones, it will be found that they are formed by incrustations of a reticulated and granular nature, which is the more accentuated the more the sensitive film has been acted upon by light, and which is without any appearance of crystallisation.

In support of this communication M. J. Girard placed under the eyes of the Academy a photo-micrograph image representing the crystals of iodide of silver mentioned above; this image was produced with a magnifying power of 800 diameters from the clear portion of a landscape negative in which no trace of fog was visible to the naked eye.

The circumstance here brought forward by M. Girard merits the serious attention of photographers, for to know precisely the nature of an evil goes much towards remedying it. Ernest Lacan

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GOLD IN EMULSION.

BY HENRY J. NEWTON.

In the *British Journal* of the 7th of July, page 324, in the closing paragraph of an article by Mr. Henry B. Berkley, he alludes to his unsuccessful experiments with the chloride of gold in emulsion. Mr Berkley asks if I can guess at the cause of failure on his part, and also that of a friend of eminence, to experience the gain in sensitiveness of which I speak.

Mr Berkley appears to have heard something of the Yankees for guessing. There is one point, however, connected with their guessing which may not be generally understood, which is that they usually know about all to be known on a subject to form a rational opinion before they guess. Now, as I do not know enough about the facts connected with the experiments of Mr. Berkley and his friend to form an opinion which would be certain of an approximation to the truth, I shall not jeopardize the good reputation of the Yankees by guessing on this subject. I know very little about the constitution of the Liverpool emulsion which Mr. Berkley used in these experiments. If it is a bromide emulsion, I see no good reason why similar results should not be obtained as those with which I made my experiments. The gold I used was the commercial article, and the solution decidedly acid.

I found that chloride of platinum produced increased sensitiveness if used quite acid, when the opposite effect was the result if used alkaline. I have never tried the gold in an alkaline condition, and am therefore unable to say whether the effect under this condition is the same as with chloride of platinum. With emulsion as I construct it, and the gold used as I use it, I should think there could be very little chance for any material variation in results. It has been quite thoroughly tested by some of our best and most practical workers here, and with uniform results in its favour, increasing the sensitiveness at least one-third.

If Mr. Berkley is sufficiently interested to repeat his experiments with an emulsion the formula for which I will now give, I feel quite sure he will obtain the same results as I have before published.

Formula for Collodion.

Alcohol	2½ ounces
Ether	6 ,,
Wood naphtha	1½ ,,
Cotton	8 grs. to the oz.
Bromide of cadmium	12 ,, ,,

To make the emulsion, add eighteen grains of fused nitrate of silver to the ounce in boiling alcohol. This gives three grains of silver in excess. When the excess of silver has acted upon the organic matter of the collodion for about eight hours, it is converted into a chloride with hydrochloric acid. It reaches its maximum point of sensitiveness in ten or twelve hours, and usually enters the foggy condition in that time, and it requires a week or more to work clear after adding the acid, if left that length of time. The free silver can be permitted to act longer on the collodion when hydrochloric acid is used to convert it into a chloride, than when the chloride of cobalt or calcium is used. I determine the strength of my hydrochloric acid by dissolving ten grains of nitrate of silver in half an ounce of water, and with a dropping tube (which I never use for any other purpose) drop in the acid until the silver is all converted into a chloride. After having determined the number of drops required to convert ten grains of silver nitrate into a chloride, I keep this sample of acid for this particular use. This is necessary from the fact that hydrochloric acid varies somewhat in the volume of chlorine which it contains. I usually add a few drops more than necessary to convert all the silver. To make sure that all the free silver has been removed, I flow some of the emulsion on to clean glass and expose to the light for a short time, and then apply some of the ordinary iron developer. If any free silver remain, it will discolour under the action of the iron, and acid should be added until no change is produced by the combined action of light and the iron developer.

Emulsion made in this way should work clear the next day after compounding, but will improve for a week, and will be found to change very little in a year. The sensitiveness can be increased by increasing the quantity of silver. Twenty grains instead of eighteen will add to its sensitiveness. I should prefer in this experiment to have the formula as given strictly adhered to. The use of the wood naphtha makes the solution of the cotton more complete, and therefore a more even flowing emulsion.

This emulsion cannot be used successfully with a strong preservative. The preservative to be used is compounded as follows:—

Water	12 ounces
Syrup of squills	1 drachm
Tincture of nux vomica	1 ,,
Laudanum	1 ,,

Let this stand twenty-four hours, and filter. This preservative can be used for months. It is not absolutely necessary to let it stand twenty-four hours, as it will give good results immediately after compounding, but I think it gives better results after a little age.

Plates prepared with this emulsion should not be washed before immersing in this preservative, but should be put into it as soon as sufficiently set, and when the greasy lines are washed off it is ready to be removed, and can be set away to dry, or can be used wet. In my experiments I always use them wet; they are, however, more sensitive when dry.

To develop, made a solution of

Concentrated ammonia	¼ ounce
Water...	¾ ,,
Bromide of ammonia	10 grains

This is stock bottle No. 1.

When ready to develop, dissolve in one ounce of water from two to six grains of pyrogallic acid; it is not very material about the strength of the pyro. solution, but it must be in water, as the alcoholic solution will not give satisfactory results with this mode of developing plates prepared with this emulsion.

After the plate has been exposed and washed under the tap, flow it with sufficient of the pyro. solution to cover it well, flow off and on until the outlines of the image appear, then pour the pyro. into a vial containing six or eight drops of solution No 1, and re-flow the plate, when the required intensity will immediately be attained. Two drops of a solution of chloride of gold, eight grains to one ounce of water in eight ounces of emulsion, make a marked difference of sensitiveness.

My first experiments with the gold solution on emulsion plates were made as follows:—After flowing a plate with emulsion I washed it with clean water, and flowed one-half of it with water containing a few drops of the gold solution, then exposed and developed.

If Mr. Berkley will treat a plate in this way, and use for the purpose water twelve ounces, gold solution one drop, he will soon discover the potency of the chloride of gold on an emulsion film. If he will add one grain of the iodide of potassium to the twelve ounces of water, he will find that this small quantity of iodide also has a marked effect. The quantity of gold can be increased a drop at a time, until that part of the plate treated with it will turn blue under the action of the light in the camera, before the rest of the plate is sufficient to show but the faintest trace of an image under the developer.

If Mr. Berkley should attach sufficient importance to my suggestions to repeat his experiments with the chloride of gold, I hope he will follow my formula to the very letter, and if he does not get the same results that I do, as well as many others on this side, we will then try to guess at the reason why. If this should happen, however, it will only be repeating what is constantly occurring, for it almost as often happens that different workers get different results in working the same formula, as that uniform results are obtained.

This emulsion can be developed with the carbonate of soda and pyrogallic acid; I do not mean bicarbonate, but what is commercially known as sal-soda. It can be used very strong with bromide of ammonia as a restainer. I have used it between eighty and ninety grains to the ounce of water—that was, just about saturation. About sixty grains to the ounce gave very satisfactory results.

Some time since the *British Journal* published a formula for strengthening emulsion plates with chloride of copper and alkaline pyro. Afterwards, Mr. M. Carey Lea published in the same journal a similar formula, substituting, however, the chloride of gold for the chloride of copper. I have used the chloride of mercury in this formula with more satisfactory results than with either of the first named chlorides.

There is still another formula which I think would give more general satisfaction on account of the rich colour it gives to the negative, which is, the mixing of chloride of gold and chloride of mercury in the proportion of one grain of gold to four of mercury. I prefer, however, the iron developer which I published some time since, as it is more under control, and the results are in every way satisfactory.

In the September edition of the *British Journal*, on the first page, there is an article on the removing of hyposulphite of soda from prints. The process alluded to is one published by me several years since, and appears to have been successfully used by a Mr. Viles. I have since, on several occasions, published an improvement on the process as first given. When the solution of lead is added to the water to receive the prints, it becomes milky by the formation of the carbonate of lead. If the prints are put into the solution in this condition the carbonate adheres to the albumen surface, and is not easily removed. This carbonate of lead is readily soluble in acetic acid; therefore a sufficient quantity should be added to the water after the lead, and the mixture agitated until it becomes clear, then it is ready for the print.

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FURTHER EXPERIENCES WITH GELATINE EMULSIONS.

BY H. J. PALMER.

During the last few months I have been making attempts to attain the great desideratum of those who work with the gelatino-bromide process—an emulsion upon which absolute reliance may be placed at all seasons of the year.

I have long ago arrived at the conclusion that the ordinary gelatine film, without the presence in it of an organifier of some kind, is utterly untrustworthy. Experience has abundantly proved this to be the case. The same batch of plates which to day will yield negatives of the greatest excellence will, a short time hence (from some cause which we will not now investigate), manifest, perhaps, an aggravating tendency to blister; or else an inexplicable invasion of red fog; or, possibly, an image of extreme thinness, which will obstinately decline to be intensified by any agent employed for the purpose. Now, I find that all these ills, and many more besides, are entirely remedied by the presence of an organifier in the film.

There are probably many substances which will supply us with what we want. Till quite recently, however, mild ale has been ascertained to be the best organifier for gelatine. In the proportions of half beer to half water nothing can exceed the excellence of results obtained with commercial pellicle. But the difficulty with me has always been to persuade an emulsion of my own making to imbibe the beer without a result of disorganization and discolouration. I have tried to organify emulsions of many kinds as regards the proportions of ingredients with uniform non-success, save in the cases I am about to detail.

I must premise that I find that those emulsions which have an excess of silver are the most workable and give the best results. Accordingly my formula is this:—

Gelatine	... 20 grains
Silver	... 20 „
Bromide	... 10 „
Water	... 1 ounce

My experiments have been confined to the three bromides—ammonium, cadmium, potassium—and of these the first only will readily admit an organifier.

With bromide of cadmium I have failed entirely. With potassium I was more successful; but the trouble involved was considerable. Six ounces of emulsion were made in the usual way with distilled water; and, after cooling, and washing for six hours to get rid of the free silver, the gelatine was placed in a vessel and allowed to simmer at a gentle heat for many hours, until three ounces only remained. To this residuum three ounces of mild beer were added, and the result was an emulsion which gave a fine creamy film, and negatives of excellent density and character. Negatives 1 and 2 are specimens of this batch, and when I tell you that No. 1 was exposed several months ago in misty sunlight for thirty seconds, and No. 2 in the exceedingly bad light of this morning for two minutes and a-half, you will appreciate the capabilities of these plates.

The substitution of bromide of ammonium for potassium removes all difficulty from the employment of beer as an organifier. Twenty grains of gelatine are melted in the usual way in three drachms of water in which ten grains of bromide of ammonium have been dissolved. Twenty grains of silver are added in one drachm of water; the emulsion is poured out to set; and then, after some hours' washing in a fine hair-sieve, on being melted four drachms of warm beer are added. Negative No. 3 was taken on a plate prepared with an emulsion of this kind. The exposure was forty seconds in misty sunshine, with Ross's 5 by 4 doublet, stop 4. Any amount of density can be got with beer plates with alkaline developer alone.

Beer emulsion, however, will not give an absolutely trustworthy film. In damp weather plates prepared with it are apt to be attacked by small fungoid spots, which spread over the plates, and ruin them utterly.

Mr. Kennett has informed me that in the case of his pellicle all the advantages of the beer process may be gained, without risk of these fungoid nuisances, by simply steeping the pellicle in ale for an hour or two, then pouring the beer away, and mixing the emulsion with water in the usual manner. My experience, however, does not bear this out. Two plates exposed together under the same conditions of light—the one being an ordinary water plate, the other prepared as Mr. Kennett suggests—gave precisely similar results, and require re-intensification with silver to bring them up to printing density.

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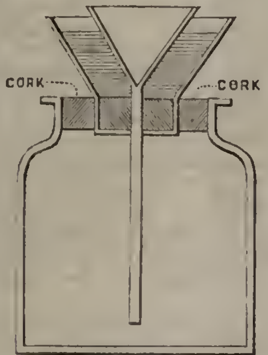
* Read before the Liverpool Amateur Photographic Association.

The question, then, naturally arises—Can an organifier be found which will combine the advantages of the beer-plate with freedom from the fungus difficulty? And I think the plate (No. 4) which I now hand round satisfactorily answers the question. Acting on the supposition that fermentation is the source of the evil in beer plates, I tried first a decoction of hops. With this I failed miserably after repeated attempts. I then had recourse to coffee, and the result was most satisfactory. Negative No. 4 was prepared exactly in accordance with the formula and details I have already given, with the single exception that coffee was substituted for beer. The films of these plates are less dense than is the case with ordinary gelatine prepared with bromide of ammonium, and are a shade slower than beer plates; but they give negatives of great softness and beauty. No. 4 was taken in hazy sunshine, with Dallmeyer's small rectilinear, stop 4, in thirty seconds.

Coffee plates admit of considerable latitude of exposure, as plates 5 and 6 will testify. Both were taken in the same light, and with the same lens and stop, yet plate 5 had an exposure of thirty seconds and plate 6 of one minute. I am glad to find that equally good results are obtained from the gelatino-coffee process when it is applied to portraiture.

No one would suppose that the picture I now pass round (No. 7) was taken on a dry film. It has all the brilliancy of a wet plate, and has amply sufficient density for printing. The plate was exposed on Tuesday last—an exceptionally dull day—and the time was forty seconds, with Ross's 5 by 4 doublet, stop 1. I should add that the coffee I have used was taken from the coffee-pot at breakfast, diluted slightly with water, and then carefully filtered.

The accompanying diagram represents a filter I have devised for gelatine emulsions. These are extremely sluggish in passing through filtering-paper, and the double funnel allows the gelatine in the filter to be surrounded with hot water.



The following facts may corroborate, to some extent, my praise of the organifier. In 1875 I took with me to Switzerland eight dozen water-gelatine plates, and on my return I found that I had barely half-a-dozen respectable negatives; all the rest were over-exposed and fogged. This year I exposed abroad the same number of plates, had scarcely a single failure, and on no plate was there a trace of stain or fog.

I have one more experience to relate, which may be of use to others. Some months ago a doctor whom I consulted recommended me to take a new a new mineral water—Hunyadi Janos. I derived no benefit from it, and gave up taking it. About the same time I was using a batch of pellicle plates which were exceedingly good in every respect but one—they blistered hopelessly during the washing after the use of the hypo. I was in despair as I saw negative after negative destroyed, and in my desperation poured some Hunyadi Janos over the plate I was then endeavouring to save. To my great delight the blistering ceased, and I find that two ounces of the mineral water to a quart of ordinary water will cure the evil.

ON THE POSSIBILITY OF EMPLOYING AGAR-AGAR IN PHOTOGRAPHY.

BY DR. J. SCHNAUSS.*

This product has been several times mentioned in this journal under the name of Agar-Agar, as an article of food, and also as one which enters largely into European commerce. On a recent occasion an article, written by a German gentlemen settled in India, appeared in this paper, which was all the more interesting from the fact that the author was a competent photographer, and had essayed to employ the material in the Lichtdruck process. Very recently I myself have conducted some experiments with the material, and have endeavoured to discover how far Agar-Agar might be employed in photography.

According to M. Dietrich, the article comes to us from India in two forms; it is either in four-angled columns of some length, or in the shape of long threads. It was the former with which I occupied myself, and which is said to be suitable for the Lichtdruck process.

The material is exceedingly light, resembling very much the pith of the sunflower, and is prepared in Japan and China from certain sea algæ, the *sphaerococcus lichnoides*, &c. The Agar-Agar must not be considered, as many photographers appear to think it is, of a gelatinous character, although it it is no doubt employed instead of gelatine for culinary purposes. The Agar-Agar contains no nitrogen, and resembles pectine, being, indeed, a pure form of carbon hydrate.

Again, it must not be taken for a kind of gum-arabic, for it has no sticky or cementing property; and this alone is to me a sufficient reason for thinking that its employment in Lichtdruck is highly problematical. It is exceedingly difficult to dissolve even in boiling water; by the addition of a few drops of sulphuric acid its degree of solubility, it is true, is greatly improved, but nevertheless a very large quantity of water is necessary, so that, on drying, a very thin film remains upon the glass plate. The worst part about it is its sudden setting, so that I was never able to cover even a heated glass plate of moderate dimensions with a uniform layer, even when an almost boiling solution of the material was employed.

Failing thus in my endeavours to employ the Agar-Agar, by itself at any rate, in the Lichdruck process, I made a few experiments with a view to see how it would answer as a vehicle for the salts of silver in the negative process, say for dry plates in place of gelatine. I found out that the Agar-Agar decomposed the silver salts exceedingly fast in the dark, so that a carefully washed plate would not even keep good until it was dry. If such plates are exposed while still moist, as in the case of a wet collodion film, they betray a great sensitiveness to light, and give, with an acetic acid pyro developer, very intense images. The action of the developer, however, still continues, even if the plate is thoroughly washed, and the iodo-bromide of silver film is scarcely to be removed by the aid of the fixing agent. Even cyanide of potassium and a hot concentrated solution of hyposulphite of soda are scarcely successful in dissolving out the haloid salts from the envelope of Agar-Agar by which they are surrounded. During drying, the film exhibits two hydrate conditions; in the first place, it swells up like a jelly, and then, after a few hours, it loses by warmth the greater portion of its water, but nevertheless remains wet until the slight film dries altogether. In this second condition of moisture, having previously been mixed with the proper amount of iodide and bromide, it is sensitized, exposed, and developed. The film in this condition possesses a high absorbent property for solutions.

If it were possible by some means or other to cover a plate uniformly with Agar-Agar solution, the employment of the material as in the wet collodion process would be attended by favourable results, but it would be necessary to employ warm fixing agents.

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* *Photographische Archiv.*

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COMMISSIONERS OF PATENTS FOR INVENTIONS

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REMOVING SILVER STAINS.

In our last issued Year-Book a communication from the late Dr. Maidstone Smith recommended the use of ammonia and iodine for removing silver stains from the hands as more efficient and much less dangerous than cyanide of potassium. Mr. Spiller pointed out, however, the risk of forming the dangerous compound iodide of nitrogen, which explodes on the slightest friction. On this subject we have just received a communication from our friend Captain Waterhouse, whose experience confirms that of Dr. Maidstone Smith as regards the efficiency of the mixture, and also as to its harmlessness. He suggests, however, other equally efficient methods of dealing with stains. He says:—

"I notice in your number for July 28th that Mr. Spiller writes upon the dangerous properties of the mixture of ammonia and iodine recommended as a photographic detergent by Dr. Maidstone Smith. I have used this a good deal, and find it very efficient for fresh stains. I believe it to be quite harmless. On making up the mixture, a precipitate is always formed when the ammonia is added to the iodine; but after a very short time this is redissolved, and the solution becomes almost colourless. I have never noticed any formation of a deposit round the stopper, and certainly not of an explosive nature. Those, however, who do not like to run the risk will find a fairly efficient substitute in first applying a strongish solution of iodine in alcohol, or the double tincture with iodide of potassium, and then a mixture of ammonia and spirits of wine. The iodine solution I generally use is the one given in the Photographic News, Vol. V., p. 345:—

Spirits of wine	20 parts
Iodine	1 part
Nitric acid	1 ,,
Muriatic acid	1 ,,

It would, however, perhaps be better to leave out the muriatic acid, because it forms a chloride which is liable to darken on subsequent exposure to light."

EDINBURGH PHOTOGRAPHIC SOCIETY.

Notwithstanding the fact that the differences of opinion which for a time marred the usual harmony amongst some of the members are entirely healed, and that those on both sides of the disputed questions are again working comfortably together, we regret to learn that the misunderstanding may possibly have an injurious effect on the forthcoming exhibition. We learn that a number of photographers have declined to send pictures because medals are to be given. It is very important, therefore, that attention should be called to the fact that pictures may be sent for exhibition, *but not for competition.* We understand that the catalogue will clearly show every case in which such a reservation is made, so that photographers objecting to the principle of competition for prizes at such exhibitions may contribute, and at the same time make no compromise of their convictions in the matter.

THE BENGAL PHOTOGRAPHIC SOCIETY.

A report just issued by this Society speaks, we regret to state, in very gloomy terms of the prospects of the Society, which, it is feared, must, unless some improvement is secured in the number of members and increase of funds, be dissolved. At a meeting held in July last, a resolution was, in fact, come to, that the Society should be dissolved; but before taking steps to give effect to this resolution, the committee issued another address to the members, and failing a satisfactory response, the Society will be dissolved in March next. In any case, no further steps will be taken for another exhibition at present. As this society has existed nearly twenty years, and by the liberal distribution of prizes for excellence has effected much good in connection with the progress of the art, we earnestly trust that the renewed effort will ensure renewed life and success. A few extracts from the report will interest many of our readers.

It is rather startling to find an exhibition in India containing nearly as many contributions as the present exhibition in London. On the last exhibition the report says:—.

> The exhibition was opened in the New Museum on the 7th February, and closed on 18th March. The contributions amounted to upwards of 350 photographs. The majority of these were received from England and Germany, and many were of a very high standard of excellence. The local contributions, both professional and amateur, were also numerous, and the latter were very much better than in the last few exhibitions. The specimens of carbon prints made in India were a novel feature in the Exhibition.
>
> The number of exhibitors this year was unusually large, and many of them contributed for the first time; but these were almost entirely from Europe, and although the committee have every reason to believe that the Society's Exhibition is an attractive one, they cannot but feel that its success depends chiefly upon the contributions from Europe, which are most uncertain and precarious, as the sending out of valuable photographs to this country involves considerable expense and loss, which in many cases must meet with no return whatever, or only a very trifling one; and the committee feel themselves very deeply indebted to those European exhibitors who continue to send out their pictures, and add so much to the interest and attractiveness of the Exhibition.

After referring to the departure from India of their president, the Honourable Justice Phear, who for eight years has held office, and the request to Captain Waterhouse to accept the office, some further interesting details regarding the society exhibition are given, to enable members to judge of the propriety of continuing the society and maintaining the exhibitions, the report concludes with an appeal to Indian photographers to make an effort to restore the society to its old active position. We cordially hope that this appeal may prove successful.

THE PHOTOGRAPHIC EXHIBITION.

The contributions in portraiture sent by Mr. Robert Faulkner to the exhibition might well serve to redeem this department from failure, even if it were more barren of interest than it really is. The number of contributors of portraits and portrait studies which are really fine is not large, but there are, nevertheless, many examples of high excellence. Mr. Faulkner takes a position, however, *sui generis* in portrait photography. His contributions are unquestionably good photographs, but they are more works of art than examples of photography. His chief exhibits this year are produced by the powder-carbon process upon opal glass. The mere process of printing these pictures is rather artistic than mechanical work, such control does it permit to the manipulator in the management of light and shade, and tone. Force or delicacy, depth or tenderness of tone and colour, may be communicated to any part of the picture at will. Of course a reasonably good negative is desirable, one in which the composition of lines does not outrage art feeling, and there must be definition and some distribution of light and shade; but these secured, and the printing process put into the hands of an artist, a fine result must follow. But beyond all this, by some strange affinity, Mr. Faulkner seems lucky in his models. That charming little "Dorothy Morison," of whom we had some portraits last year, again appears in large full length, just as winsome. Sweet Little "Winifred Peploe" is depicted with rare tenderness, and "Rudolph Lehman" is also admirable. In producing "Friends and Companions," Mr. Faulkner has secured noble animals with all the felicity with which he obtains instantaneous portraits of beautiful children, and easy and natural grace of pose distinguishing all, no matter how apparently without arrangement. Mr. Faulkner is one of those who insists that wherever art can be applied to ameliorate and improve photography, in retouching either negative or print, it should be done; but there are few photographs exhibited in which the intervention of the pencil is so little obvious as in the majority of his works now in the exhibition.

Of the academy portraits of Mr. Warwick Brooks we have already had occasion to speak. His contributions to the present exhibition are very fine examples, both in technical photography and art feeling. Some character portraits of artists in suits of armour sent in by Mr. Rowland Taylor are excellent. Not only is great technical skill displayed in giving a satisfactory rendering to the shining metal textures, but the pose, arrangement, and general feeling, both in repose and action, belonging to equipment and the period, are admirably preserved. Not suits of armour enclosing dummies, but portraits of armed men, are presented. Messrs. J. Chaffin and Son exhibit some large pictures of very fine quality. The photography, technically speaking, is of singular excellence, and there is much art quality: the light and shade and composition are generally good. In the "Trio" taken from life (191) there is, however, a little failure in the models to realize the idea; there is a lack of absorbing interest in the music, and a consciousness of sitting before the camera. In "Checkmated" (178), consisting of the same figures, the idea is better carried out, and is more effective and satisfactory. Mr. H. Garrett Cocking contributes several portraits and portrait studies, and has been fortunate in his model. In 215, entitled "What'll Missus say?" a pretty maid-servant holds in her hand the fragments of a jug she has broken, and, with an arch sense of fun as much as of fear, wonders how her "Missus" will regard the catastrophe. His contributions 159 and 208 are also very good.

Mr. A. Ford Smith sends a couple of figure studies with landscape backgrounds. In "Water Lillies" (163) we have a group of girls, and a charming landscape. The picture is manifestly produced by combination printing, and illustrates some of the difficulties of this mode of working. The idea, the composition, and the photography are admirable, but the combination is not quite successful. All the figures are admirably placed, the standing figure in profile in the foreground is singularly graceful in pose and arrangement, and the landscape portion is fine. But the fact that the picture was produced piece-meal is rendered apparent by the absence of reflection of the lily just held over the surface of the water, and of any ripple or break of the surface from whence the lily has just been lifted, and by some want of cohesion in the whole. The excellence of the conception and of the execution of many parts have induced us to point out the drawbacks in detail with more minuteness than we should have done. If the single figure we have mentioned had been exhibited as a separate picture it would have been one of the most charming in the exhibition. Mr. J. M. Young contributes some very admirable portraits and portrait studies, and a composition entitled "Yes or No" (119). It is the old, old story which never grows stale, but possesses a perennial interest: a lover asking for a definite answer from his lass. The photography is excellent, and the intention good. The picture was produced, we are informed, from fifteen negatives. To produce a perfectly articulated, homogeneous whole from so many negatives is an almost superhuman task, and, as a whole, it lacks reality. The effort itself is praiseworthy, and much of the work is good; but the next attempt will be much better. The single figures 129, 130, and 131 are all very admirable. Mr. S. G. Payne exhibits some examples by solar portraiture of high quality. Colonel Stuart Wortley exhibits a large direct study from life (164), which is less successful, we think, than many of his former contributions in this direction. The face is somewhat in shadow, the principal light being upon a light-textured scarf worn on the shoulder. This scarf is admirably rendered, but there is a want of tenderness and transparency in the flesh tints. Mr. H. Gregson's portraits and figure studies are good. A number of Lambertype portraits by the Autotype Company are in every way admirable.

The "Men of Mark," exhibited by the Woodbury Company, give almost startling evidence of the high state of perfection to which Mr. Woodbury's printing process has been brought. The portraits are capital, and the prints equal in every way to any upon albumenised paper. Mr. Hanson exhibits examples of what is termed "Cretaceous Photographs," which are highly finished by hand. A frame of card pictures he exhibits (292) is very excellent. There are not many card pictures exhibited, but we mention amongst exhibitors of this class of work the names of Boucher, W. and A. H. Fry, W. Protheroe, A. Oeffelein, J. A. Vesey, and others. Mr. Spiller exhibits some of his early work in portraits of Professor Hoffman and General Garibaldi.

Mr. Adam Distin, whose name will be remembered as contributing some years ago a few clever *genre* photographs, sends a pretty little thing entitled "Evening Prayer." Mr. Cobb sends a series entitled "The Bird's Nest," apparently enlargements of a pretty little series produced in card size some time ago. Mr. Gillard sends a good single figure study, entitled "Haymaking," and another entitled "The Gleaner." Mr. J. Vaughan sends some studies of animals, of which "Sighting a Stranger" (114) is best. It is a portrait of a young bullock just turning his head, with a look half-ferocious, half-inquiring, as he catches sight of an intruder. This is very capital, as is also a "Berkshire Farm" (196). Mr. A. G. Taylor and Messrs. Barry and Co. exhibit capital portraits. There are a few others which do not call for especial notice.

* * *

DURABLE CEMENTING MATERIAL FOR MOUNTING PHOTOGRAPHS.

BY M. STRAUB.*

The following are details for the preparation of a starch or paste which deserves to take rank before all other materials of the same kind. Those who have once used the same will never, I am convinced, employ any others.

Particularly may it be recommended to photographers who are employed in carbon printing, for it possesses the property of great durability. In its preparation the principle point is that the arrowroot should be pure, and free from adulteration; I have made experiment with some purchased in Prague, but failed altogether in getting good results, for the simple reason that it was largely adulterated with potato-meal. A genuine arrowroot is absolutely necessary.

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* *Photographische Notizen.*

The recipe for the preparation is as follows:—

Best arrowroot (Bermuda) ...	52 grammes
Gelatine	6 ,,
Spirits of wine	35 ,,
Carbolic acid	6 drops
Water	525 grammes.

The arrowroot is in the first place reduced to a paste by means of forty grammes of the water, and then the remainder of the water, together with the gelatine, after it has been cut into little pieces, is added, and the whole brought to a boiling point, taking care to stir meanwhile. The paste must boil for at least four or five minutes, or it would not be good. It is then put on one side to cool.

When it has become lukewarm, the carbolic acid, mixed with the spirits of wine, is very gradually added in a little stream, the mixture being stirred the while, and this completes its preparation.

More than a pound of the best cementing material is the result, which should be stowed away in a wide-mouthed bottle, and provided with a cork to protect it from dust. Only as much of the material as is required for immediate use should be removed at any one time. It will be found very soft to use, to cement very firmly, and to possess particularly good keeping properties; moreover, it is quite free from hard and lumpy particles.

Correspondence.

THE PHOTOGRAPHIC EXHIBITION.

Sir,—Will you kindly allow me to apprize your readers and photographers generally that a letter on the Exhibition which appears in the *British Journal* of the 6th instant, signed "A Member of Council," is not issued by authority of the council, which until this evening has not had occasion to hold a meeting for some months. The letter is so full of offensive personal animus, and of that spirit of rancour and jealousy which has already done the Society considerable injury, and is so discreditable to the writer and to the pages in which it appears, that it is, I think, necessary to caution photographers against any supposition that such a letter receives the sanction of the council, much less that it is issued by their authority.—Yours, sir, obediently, Another Member of Council.

Sir,—I have been considerably amused at a letter which appeares in what is styled the "wider and more influential circulation" (!) of your contemporary, in reply to the outspoken letter of a "Country Photographer," which appeared in your pages of the 29th ult. This reply, sir, is, or purports to be, from "A Member of Council," and I am bound to say that if the members of council generally are of a similar pattern to this volunteer sample, I am not surprised at the exhibition of blunders complained of. I must confess that I cannot follow him when, with "all the kind mendacity of hints," he endeavours to hold up to scorn some poor wretch who has been unfortunate enough to gain every class of medal—gold, silver, and bronze—and now, because he neglects to exhibit, gets no medals at all! The "Member of Council" evidently knows who is who, and indicates how one may find out who the "Country Photographer" is. Why did he not speak out and print the name? I find it difficult to examine the Show on the ground. I fancy, too, that "Member of Council" did not find stooping very easy! There is one point upon which the "Member of Council" is more explicit: he tells us that the writer of the letter signed "A Country Photographer" veils his personality under a pseudonym." Consulting my Webster I find that *pseudonym* means a false or fictitious name, hence the said writer is *not* a country photographer? That relieves my mind. I cannot be suspected, although I, too, might be hinted at in his letter, being also

A Medallist.

PS.—Since the "Member of Council" has set the example of guessing, would it be imprudent to guess that he never obtained a medal in his life, either gold, silver, or bronze, but began and ended in "the ruck of exhibitors?"

Sir,—I read with profound and painful interest the letter of a "A Country Photographer," which appeared in your pages some days ago. Trenchant in style, and deeply important in its subject matter, I felt satisfied that it must have a beneficial effect on the deliberations of the Council of the Society, whom I, in common with all loyal members of the Society, I hope, credit with aims for the good of the Society. With (as I have no doubt) really good intentions, they have (equally without doubt) committed several blunders in this year's Exhibition, which "A Country Photographer" exposed certainly in a somewhat ruthless manner; but this should not in any wise diminish the effect of the lessons it suggests.

In the last issue of your contemporary I find a letter in answer, appended to which I read, with unmixed pain and regret, the signature of "A Member of Council." Whether this member writes as an individual expressing his own opinions, or representatively and under sanction of the Council, is not stated; but it is to be sincerely hoped that it is individual presumption, and not official sanction, which has prompted a letter which is at once weak, personal, and foolish, and would be impertinent if it had sufficient force or point. Its feeble "utter denials" and personal innuendoes would pass unnoticed, but for the quasi-official sanction given by the signature, and it is this alone which induces me, as a very old member of the Society, to repeat and endorse the indictment framed by "A Country Photographer" against the authorities who controlled the Exhibition.

The first item in the indictment is to the effect that never was the Exhibition smaller in quantity, or poorer in quality, or more destitute of novelty. Let me add the proof. In 1873, the last year of the old regime, the number of exhibitors was 128, and the number of exhibits 518, and this was typical of many preceding years, a steady but slight increase appearing for several years up to that time. Then came the miserable disruption in the Society, which your correspondent attributes, with only too much truth, I fear, to "two or three self-seeking men, agitators and revolutionists," and ever since there has been a steady declension in the Exhibition, which this year culminates, the number of exhibitors being 78, just 50 less than in 1873, and the number of exhibits 365, just 153 less than in 1873. Then as to the falling off in quality, I think, without disparaging the excellence of the work now exhibited, it is only necessary to glance at the names which are absent, to arrive at a conclusion on that subject. As to the paucity of novelty, here is the simple fact that, with the exception of examples of Herr Warnerke's film, there is really nothing new. There is not an example of photographic engraving; there is no example of Vidal's photo-chromes; there is no example of the recent described process of printing photographs in dye colours; there is not an example of photo-ceramic work. I might continue this list, but it is not necessary. In regard to these important counts in "A Country Photographer's" indictment, "A Member of Council" is discreetly silent, and offers neither defence, explanation, nor palliation.

The next charge of "A. C. P." is, that the time for the exhibition is too early, both because photographers are too busy to attend, because many residents in London are out of town, and because contributors are not ready. As "A. M. O. C." admits this, it is not necessary to dwell upon it here.

The next charge of "A. C. P." is, that the hanging is bad, and is upon a bad principle. This is a point upon which difference of opinion may legitimately exist, but it is not disposed of by the dogmatic and "utter denial" of "A. M. O. C.," nor by the personal inuendoes which accompany that denial. Certain it is that, in most cases, exhibitors object to the scattered style, and it seems to me to bewilder visitors. But whether the principle be right or wrong, no defence can be offered of the fact that in many cases unimportant pictures are on the line, and fine and minute photographs either skyed or on the ground.

The next count in the indictment is, in my view, the most important one. In the published conditions of exhibition it is distinctly announced that "no name or any information will be allowed to remain on the glass or frame," &c. This innovation is most singular and inconvenient, robbing the exhibition of much interest to visitors, who do not desire to refer to the catalogue continually, and robbing it of much value to exhibitors, who may desire to add considerably to the interest of their pictures by appending a few words of explanation. This was bad enough: but worse remains behind. After this distinct announcement that names, &c., would not be allowed to appear, and after the fact that, in some cases, it is manifest that names have been erased, some pictures are prominently hung with both names of exhibitors and other information prominently inscribed on the frames and mounts of the pictures; and, worse than all, one of the chief sinners in this matter is a member of the Council of the Society!

> "Who would not laugh, if such a one there be?
> Who would not weep, if Atticus were he!"

I might with propriety stop here, as after this flagrant disregard of their own conditions nothing can add much more to the discredit of the exhibition authorities. But "A. C. P." mentions another matter to which "A. M. O. C." makes no reply. I refer to the unwise innovation of attempting to convert the opening night of the exhibition into a dress soiree. I can fully credit the council with the laudable aim of elevating the tone of the opening night. I think there are many arguments against the attempt to enforce evening dress; but it is not worth discussing now, since the logic of facts has decided the question. The attempt is a failure. It has destroyed the pleasant reunion of five or six hundred persons interested in the art, without substituting anything better. Last year it issued in diminished numbers; this year it was worse. Not one quarter of the visitors were present which at one time used to come; and of these about half, with the sturdy independence of Britons, declined to comply with the evening dress edict. It is, perhaps, difficult to say why. Perhaps it may be that many worthy photographers, members of the Society, not entering much into fashionable "society," have more imperative demands upon their means than that involved in the cost of a "dress" coat. Possibly some two or one may object as a matter of principle, and, like Parson Wilbur, as described by Hosea Biglow, declare—

> . . . . "He never heerd in his life
> That the Apostles rigged out in their swaller tail coats."

Be the cause what it may, the fact is there. The attempt is a failure.

To all these matters, so definitely associated with the decline of the most valuable work of the Society—its exhibition—this member of the council, who volunteers a rejoinder, has simply inuendoes and taunts to offer. He guesses at the individuality of the "Country Photographer," hints at some one who used to get gold medals, and makes some incomprehensible allusion to the Crawshay competition. He finally gives some advice to some "party" to loyally support the Society, referring to what he describes as the practice "in the wider field of politics," in which the "minority cheerfully and willingly undertakes its share in the work of the nation." As the share taken by the Opposition in Parliament chiefly consists in thwarting the measures of Government, and leaving no stone unturned by which a chance of turning their opponents out of office may be secured, I hope no party in the Photographic Society will ever take the advice of this member of the council.

As my chief aim in troubling you with this long letter is to make one or two suggestions for the good of the Society, I will avoid personal inuendo or attempts to remove the very thin disguise from the member of council. I would simply urge on the council to put themselves in accord with the very manifest feeling of many members of the Society in regard to the exhibition. No one can glance over the list of officers without being convinced that, with very slight exception, it consists of capable and honourable men, whose motives cannot be doubted. But it is clear that they are making unwise innovations in the time and mode of managing the exhibition, which are gradually destroying it. Inexperience may excuse one or two failures; but persistence in a course manifestly followed by failure will be as culpable as disastrous.

In apologizing for the length of this letter, I must ask for space for another word on a point which has caused me some amusement. This Curtius of the council, in opening his letter, refers to the "wider and more influential circulation" of the pages in which he writes. If he is not "chaffing" the Editor, he must be conscious of a glaring practical solecism in giving the answer to a number of people who have not seen the conundrum! It is, of course, more than probable he refers to a subject upon which he cannot possibly have any knowledge. The allusion is as meaningless as the remainder of his letter.—Yours, sir,

An Old Member of the Society.

Dear Sir,—I have read and re-read the letter in a contemporary journal on the Photographic Exhibition, signed "A Member of Council," and have no hesitation in saying that it is not only in bad—execrably bad—taste, but so laboured, stilted, and obscure in style, that it may fairly take rank as one of the worst compositions of its class. Imagine the writer, when such words as "thrown into the waste paper basket" would have answered, using these—"which might perhaps be properly relegated to the department ordinarily occupied by complaining letters of disappointed partisans"! He then proceeds to make comments such as, he says, "may be most fitly given," and the seven paragraphs of his letter which follow supply us with the language he considers as fitly appropriate for his purpose. The council has just reason to be ashamed of the member who can so write, for no words can sufficiently condemn his style, taste, and sentiment. Take, for instance, the fourth paragraph. I know not, nor can it be worth while to inquire, to whom it refers, but "A Member of Council" who writes such a sentence as that in which the words "one special name" occurs, is certainly not to be envied. Another sentence in the same paragraph—"If they persist in this course, oblivion is surely in store for them"—is striking and singular not only for its sheer impudence, but for wretched manner, bad style, and want of taste; and as evidence of the total lack of judgment and discretion on the part of the writer, read the sixth paragraph, a paragraph I commend to the attention of both the council and members of the society. I admit, that by reason of the ungrammatical construction of the two first sentences of this paragraph the sense is somewhat difficult to reach, for they read thus—"were frustrated by a certain set, who were either perfectly incompetent to judge of the merits of pictures, or else reckless of public opinion, as the decisions were so monstrous as to rouse an indignation rarely seen. Exclusion from power was instant on removing from them the means of self-election." As these words stand, they appear to imply that the decisions were excluded from power, and that the decisions had the means of self-election removed from them! Out of this jumble of words, however, the meaning of the writer may be extracted, and I say that his paragraph, and indeed the whole letter, should receive the consideration and judgment of the council at the very earliest opportunity that is possible.

The final sentence of the letter adds to the impertinence of the words I have already quoted, for the writer says:—"If certain names are absent much longer from photographic catalogues, they will be spoken of as extinct volcanoes."

To this very silly and extremely indiscreet letter, I would submit that the simple and effective reply is, that the failure of the Exhibition—or, in other words, the absence of the exhibitors referred to—is due alone to the period of the year the exhibition is held, and not in the slightest way to disloyalty to the Society. I cannot think that there is any foundation for the assertion that those who were in power before the present council came in, purposely absented themselves from meetings and exhibitions.

In lieu of long dreary evenings, make the meetings attractive, and members will be sure to attend: hold the exhibition at a reasonable time, and the list of absentees will be materially reduced.

I can answer for myself that so long as the Exhibition is held at the time it now is, it will be out of my power to contribute, even though "oblivion is surely in store for me," and I am spoken of as "an extinct volcano."

The question of holding the Exhibition at its present period is one which will so inevitably be discussed at an early meeting of the Society that I need not now go further into it: it was the letter of "A Member of Council" I desired to make the subject of my own, and to that subject I limit myself.—I am, sir, yours obediently,

43, *Piccadilly*, 9*th October*. VERNON HEATH.

THE EDINBURGH EXHIBITION.

Sir,—One would naturally expect that a gentleman so ready to charge others with reckless assertion would take care that his own facts, at least, were unassailable. It is not the case that I was in Edinburgh for some ten days after the publication of Mr. Neilson's letter on the 21st July; I left on the 13th July for Ross-shire, where I have since remained. It is wholly untrue that Mr. Bashford, who has never written to me on the subject, had any authority whatever for his communication. The fact is, owing to my not having subscribed to either journal before the 1st August, I should, but for that communication, have remained in ignorance of my letter having been honoured with a reply from Mr. Neilson. On first noticing what Mr. Bashford had written, some considerable time after your notice of his letter appeared, I wrote to him for a copy of the journal containing Mr. Neilson's letter, but, receiving no answer, I applied for and obtained a copy elsewhere. The inference sought to be deduced from reckless assertions, as also the empty vapourings, more what one might expect from a cranky old woman, writing under well merited castigation, than a man of mature years, conscious of a good case, I can afford to smile at.—I remain, &c.,

A. WILLIAMSON.

Kelellan, Loch Alsh, Ross-shire, October 3rd.

TRANSPARENCIES ON ALBUMENIZED GLASS.

Dear Sir,—In last week's News there is an article taken from the *Photographic Times*, viz., "Transparencies on Albumenized Plates." Its appearance is a direct proof that there is in the photographic profession one person at least whose word and promise are not to be relied upon, as the article in question is as near as possible word for word what a great many photographers (ourselves among the number) paid £5 5s., for to Mr. B. J. Edwards, of London, his process of making transparencies for enlarging, &c.

Now we think that the person who wrote that article ought to have signed his name to it, or otherwise have acknowledged it as Mr. Edwards' process. We do not feel in any way chagrined at the publicity thus given to a process we have paid for, but are sorry to find photographers have so little regard for their word as to break the agreement they must have signed with Mr. Edwards. If the thing had been disguised a little, it might have passed muster as a new or modified process, but to copy nearly verbatim the whole thing as given by Mr. Edwards is certainly too bad. We should be very glad to know what Mr. Edwards has to say on the subject.—Yours truly, WOLSTENHOLME BROS.

Blackpool.

[Our correspondents have of course noticed that the article in question is quoted from an American contemporary, by whom no reference is made to any resemblance in the process to that of Mr. Edwards. How far the general form and details, as there given, justify the assumption that it could only be so given as the result of a breach of faith, we of course cannot say; but we may remark that the process itself is not essentially new, a similar method having been published in our pages many years ago. Mr. Edwards did not, if we remember rightly, claim essential novelty for his process, but rather the judicious combination of known methods. Apart from all this, following out the principle of the patent law, which gives the originator and his licensees a monopoly for a definite period, it is probable that few concerned in the secret will now feel much averse to its publication.—Ed.]

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The first ordinary meeting after the summer recess, was held in 5, St. Andrew Square, on Wednesday evening the 4th inst., the President Dr. Thompson in the chair, who said that before the business of the evening commenced, he must congratulate the members on the large attendance at this the first meeting of the session. It was always gratifying to see meetings fully attended, and especially so at the commencement of a season.

The summer just coming to a close had been on the whole favourable for landscape work, yet from some cause or other there had been fewer out-door meetings than in former years. This was in one sense a matter for regret, as it was desirable that members of the society should give a good account of themselves at the forthcoming exhibition. He hoped that the large attendance of to night would prove a good augury of the success of the session, not only in the usual work with which most of the members were now pretty well acquainted, but in the not less important arrangements required to bring the exhition to a successful issue, a kind of work of which as a society they had little experience. One thing was quite certain, that there would be a very large amount of hard work to be done, and he hoped every member would do his utmost to assist the council in the somewhat arduous undertaking.

The minutes of previous ordinary and out-door meetings were then read and approved, and Messrs. Alexr. Ayton, Murray, and Geo. Scott, were admitted ordinary members.

Mr. W. H. Davies, read a series of suggestion as to "what should be done to make the exhibition a success."

He said that success, such as the members ought to aim at, depended on two things. First, the exhibition must be made sufficiently extensive, varied and attractive to be worthy of the attention of the general public, and secondly every effort must be made to give it the popularity that alone can secure a financial success. Personally he believed, that now that the little differences on matters of detail, that had for a time disturbed the usual harmony of the Society, had been amicably adjusted, the well known energy of those in whose hands the bulk of the preliminary work lay, was a sufficient guarantee that all that could be would be done, and his object now was more to stir up the members generally to aid the council, than to suggest anything to the council itself. He then entered somewhat minutely into what he considered the best arrangements both to get the exhibition into working trim, and to get up the required interest in the public mind to ensure the desired attendance of visitors, but most of the suggestions were only of local interest, although one relating to the formation of a catalogue is well worth the attention of promoters of exhibitions generally. One of the conditions to be observed by contributors is that the title of the picture, name of the artist, and such other information as may be thought necessary, is to be written on the back of each frame or case, and Mr. Davies proposes that as the pictures are unpacked, slips of paper, containing copies of such information should be stuck on the fronts of each. Then after the pictures are hung and being numbered, a corresponding number shall be marked on each slip. Those slips are then to be taken off and handed to the printer as MSS. for the catalogue. Another suggestion which may be useful to other societies, is to utilise such lantern pictures as may be sent for exhibition by devoting an hour on several evenings during the time that the exhibition is open to a practical illustration with the lantern, and a descriptive lecture, in the style so long popular in the Edinburgh Society.

The **President** said that they were much indebted to Mr. Davies for the thoroughly practical suggestions that he had made, and was sure the members would be pleased to hear that the council had associated him with the committee entrusted with the business arrangements, as there was no one in the Society who had had such experience or was so able to help in that kind of work. He thought, for the information of the members present, it might be well if the exhibition secretaries would just give a rough outline of what had been already done.

Dr. **Nicol** and Mr. **Dobbie** said that their work hitherto had mainly been the sowing broadcast of the knowledge that an exhibition was to be held and the conditions on which pictures would be received. That had been done by the issuing of copies of the circular formerly submitted to the Society. Copies had been posted to nearly every photographer in Britain, America, India, the colonies, and the Continent had also, so far as practicable, been attended to. Secretaries of societies, editors of photographic publications, and others likely to take an interest in the matter, had been furnished with circulars for distribution, and from the numerous replies and queries that were daily coming to hand, they had no doubt that every likely man had already been made acquainted with our wish to make the exhibition one of the best that had yet been held.

On the motion of Mr. **Dobie**, a suggestion of Mr. **Davies'** to appoint a small committee to endeavour to collect as many specimens of earlier processes as possible, was resolved on, and the committee appointed, and we are requested to say that the council will be extremely obliged if those possessing anything unique in this direction, and who may be willing to lend it for exhibition, will kindly communicate with either of the Secretaries.

Mr. Turnbull and Mathison then made a communication, being their "Experience in Working Emulsion Plates."

They said that for a long time they had successfully wrought the favourite beer and albumen process, but some time last year began to wish for something more sensitive. After the communication to the Society by the Rev. J. H. Palmer, they went very heartily into the gelatine process, so strongly recommended and successfully wrought by him, but ultimately abandoned it in consequence of the difficulty of getting anything like suitable density, or preventing the frilling and cracking up of the film, these objections were equally present in emulsions made by themselves, or from the pellicle supplied by Mr. Kennett. Their attention was then turned to collodio-bromide emulsion, which, as they were at present using it, was all that could be desired. After numerous experiments, they had discarded all modern innovations, or so-called improvements, and were quite satisfied that for all ordinary work the original formula or something very near it was the best. The formula that they now used was published in the *British Journal* a number of years ago, and consisted of cadmium bromide, 6 grains; ammonium bromide, 3 grains; and silver, 11 grains to each ounce. The emulsion thus made keeps for two or three weeks at least, is rapid enough for any one who seeks good results more than many pictures, and under a suitable developer acquires density readily, in fact that the development was almost as rapid as with wet collodion. For some time they had used tannin as a preservative, but certain markings and blemishes had been attributed to it, and now they used ordinary draught bitter beer, and found it quite satisfactory.

They further stated that in their opinion the sensitiveness of gelatine emulsions had been much over-rated, and handed round three negatives, a gelatine collodio-emulsion, and a washed emulsion that had each got the same length of exposure, intentionally short. The gelatine was undoubtedly the best, but very little better than the ordinary emulsion, while the washed emulsion was very much under-exposed.

They then proceeded to develop a plate-using a 60-grain solution of carbonate of ammonia to which at first only a few drops of a 60-grain solution of pyrogallic acid was added, bromide in the case of a beer preservative being unnecessary, and the image almost immediately appeared. When the detail was pretty fully out, but still quite thin, a few more drops of the pyro. solution were added, and under that the negative rapidly acquired sufficient density. A large number of negatives varying in size from 7 by 5 to 16 by 13, were handed round for examination, and were much admired.

A number of those present expressed themselves much pleased with the process as illustrated and with the result exhibited, and intimated their attention of adopting it.

Mr. **Aird** had experimented a good deal with the emulsion as now wrought by Messrs. Turnbull and Mathieson, and found it quite rapid enough for ordinary purposes. He, however, preferred tannin as a preservative, and was convinced that it was more rapid than beer. He also exhibited three negatives similar to those shown by Messrs. Turnbull and Mathieson, and it was generally admitted that the ordinary emulsion was quite as well exposed as the gelatine, while the washed emulsion was poor and thin and wanting in detail.

The **President** said that there could be but one opinion of the process, and the care and ability of the operators by which such beautiful results had been produced. He was glad to hear so many members say that they should give the emulsion a trial, as he did not think its merits had been as yet sufficiently appreciated in Scotland. His advice to members would be to discard all or nearly all that had been written on the subject during the last few years. The fact was that the emulsion process was very much like the wet collodion process in this that both were given to the world in as nearly a perfect condition as possible, or, at least, that no real improvement had been effected on either. The emulsion process, as given by Syce and Bolton twelve years ago, was, with the exception of requiring to be strengthened in silver bromide a little, vastly superior to anything that had been the outcome of much or all of the trash that had since been written regarding it.

Mr. **Laing** showed a negative with an image similar to that exhibited as a "puzzle" sometime ago by Mr. Dallas. He explained that, in trying to copy a picture with wet collodion, he had given an exposure of half an hour, and that on development not a trace of the picture appeared, nothing, in fact, but the abnormal image now shown, while a second plate, under similar conditions, had yielded a good negative. The plate was examined with much interest, but no suggestion of a probable cause was made.

A number of pictures, the contributions of the Secretary and others, were balloted for, votes of thanks given to all who had taken part in the evening's proceedings, and the meeting adjourned.

The last out-door meeting of the season was held on Friday, the 6th inst., the locality chosen being Hatton House and grounds. The party drove from Princes Street, starting at 9.30, and returning between 4 and 5 o'clock.

Hatton House, formerly the seat of the Lauderdale family, at one time the residence of Jeffrey, and now occupied by Mr. Findlay, of the *Scotsman*, is a curiously interesting pile, a combination of the old Scottish baronial and the Scoto-French chateau, with considerable later additions in the Renaissance style—more interesting than beautiful, but affording subjects for a number of fine pictures. The grounds are extensive, and contain some very fine old trees, and a picturesque sheet of water, which together provide food of a most desirable nature for the camera; and yet it is somewhat strange that although only eight miles west of Edinburgh, and not far from one of the three great roads that connect that city with Glasgow, it is a *terra incognita* to many of even the landscape photographers of Edinburgh. The pleasure grounds of Hatton House originally extended to 240 acres, and included magnificent trees, numerous lakes, fountains, and ornamental terraces and pavilions; but, like most other residences of its kind and time, it is now sadly shorn of its former glory. Enough, however, remains to make it well worth the attention of the photographer, and now that the Edinburgh Photographic Society have found it out, it is likely to become a favourite haunt of the "camera men."

The day was, on the whole, not unfavourable for photographic work, although the light was weak and somewhat irregular, requiring exposure of from ten to thirty minutes, with both emulsion and beer plates; but nevertheless a number of good negatives have been secured. When such long exposures are necessary, the time is apt to hang heavily on hand. One of the party hit on an excellent expedient by which to wile it away, *i. e.*, the telling of stories or incidents that had occurred in connection with the building. One of these caused at the time of the occurrence considerable excitement in Edinburgh and elsewhere. It appears that a

Captain Davidson, to whom the property at one time reverted, resolved to, as far as possible, restore it to something like its former grandeur, and in the attempt got himself into very embarrassed circumstances. He was for a time residing with his family near Herne Bay, on the Kentish coast, and went to bathe one day, and did not again return. His clothes, watch, &c., were subsequently found, and of course it was supposed that he had been drowned. This was the more readily believed as he had spoken to the tollman on the pier, to whom he had paid the penny on going on, and who had not seen him return. He had also spoken to some workmen on the pier.

His life had been very largely insured shortly before, and in due course the money was paid, and the affair forgotten except by those nearly connected with him. It turned out, however, that he had not been drowned. He went to the end of the pier, and divesting himself of his clothes and watch, laid them where they were found. Under his ordinary dress he wore one similar to that of the workmen employed on the pier, and in it he passed through them and the toll unsuspected.

He went to France, and lived there for a considerable time. By-and-by his family visited Paris, where they were discovered by the captain, who took care not to make himself known to them. He haunted the hotel in which they lived, and had the pleasure of seeing his wife and children riding out, and, so complete was his disguise, that he one day actually handed his daughter into the carriage without being discovered.

Years rolled on, and the family lived in seclusion in Edinburgh, but the captain could not rest abroad. He returned to Edinburgh, and used to sit for hours watching the house in which they lived from the opposite side of the street. At last he could stand it no longer, and wrote to a sister of his wife. How the insurance offices became aware of the fraud is not known, but they did, and immediately obtained criminal warrants for his arrestment, and his creditors arrested everything belonging to the family. The estate was sold, and of course general ruin followed.

Members of societies, who attend out-door meetings and give long exposures, make a note of this, and always see that the party includes a good story-teller.

Talk in the Studio.

Bristol and West of England Amateur Photographic Association.—We are glad to announce that effort recently made to revive and extend the operation of the Bristol Society, to which we recently referred, has proved successful. The preliminary meeting, held at the offices of Mr. Daniel, was of an enthusiastic and encouraging character. New rules were adopted, and plans laid for making the meetings pleasant and instructive, and so securing an active and successful society. We hope all photographers coming at all within the district will join the society, and aid in securing its prosperity and advancement.

Photographic Illustrations of the "May Queen."—Photography is daily increasing in its application to purposes of illustration in place of lithography, &c. Mr. Raphael Tuck is issuing some photographic reproductions of clever drawings in illustration of Tennyson's "May Queen." "A Claimant for Woman's Rites," consisting of an archly pretty girl, is another of Mr. Tuck,s series.

Early Days of Photography.—In the "Story of Notes and Queries," by Dr. Thoms, we find the following reference to the early days of photography, when *Notes and Queries* was the chief journal in which photographic novelties were discussed. Dr. Thoms says:—"My older readers will remember that 'N. and Q.' was the first journal which opened its columns to a record of photographic discovery and progress—a step which was not universally approved. Among my warmest supporters in this matter was Sir Frederic Madden. My friend Dr. Diamond, whose characteristic it is to carry into any investigation, scientific or antiquarian, which he may be pursuing, as much intelligence as energy, had recognized the value of the collodion process, and speedily contributed largely to its improvement. He was, I believe, the first to take a negative and print from it a positive copy of an old MS. I remember well his sending me two small specimens of photographic copies of early manuscripts; and I can never forget the delight and admiration expressed by Sir Frederic as he examined them, and saw every line, letter, and contraction copied with a truthfulness no human hand could approach, and learned that, the negative once accurately taken, copies of it might be produced in any number. It was only consistent with his love of truth in all things that the worthy keeper of the MSS. should encourage the efforts of 'N. & Q.' to promote an art calculated to be of such service to archæology in all its branches, and to prove a source of delight to thousands. I remember, soon after 'N. & Q.' was started, the Rev. John Hunter, the learned historian of Hallamshire and commentator on Shakspeare, congratulating me on being entitled to the prize which Alexander the Great had offered for the discovery of a new pleasure; and soon after the publication of full instructions for the successful practice of the art of photography in these columns, the good Bishop of St. Asaph, Dr. Vowler Short, paid me the same compliment nearly in the same words, adding that I was a public benefactor in publishing such a source of innocent and instructive amusement for the use of those who might have the good sense to avail themselves of it. Before leaving the subject, I must express my conviction that some of the simple processes discovered and published by Dr. Diamond in 'N. & Q.' have never been surpassed, and rarely equalled; and that my worthy friend's services to the art have never yet been sufficiently recognized."

To Correspondents.

G. Walter.—Your formula appears to be right; the article in which it occurs appeared in our number for June 23rd, and further details on July 28th. If you give such plates a full exposure, you will obtain rich warm colours without any toning.

M. F. L.—Different samples of chloride of gold contain different proportions of free acid. The simplest mode of neutralizing and avoiding excess of alkali is to use chalk, which, being insoluble, does not make a solution alkaline, although it neutralizes free acid.

X. Y. Z.—We have noticed the peculiarity of texture—or "woolliness," as you phrase it—to which you refer in Colonel Stuart Wortley's picture of "Clouds" in the exhibition. Whether it is intentionally produced, or the result of accident, we cannot, of course, say; but on the whole we think it adds something to the atmospheric quality, and cannot be regarded as a defect. Such a texture might be produced in various ways. Printing through a film of gelatine or collodion upon which had been produced an aqua-tint grain would do it. The picture being printed in carbon, it is not impossible that a reticulation, accidental or intended, in the gelatine film might produce it. We might mention many more methods by which it has been attempted to give a grain to the image, especially with a view to photo-engraving purposes; but space in this column does not permit.

Vertuoso.—The formula you quote, which, as you would note, was from a continental journal, is a little roughly stated, but there is nothing incomprehensible about it. The persons to whom you took it for preparation probably knew nothing of chemistry. If you take it to a firm like Hopkin and Williams, who are manufacturing chemists, they will doubtless supply you. The solution of acetate of iron may be made by dissolving equal parts of crystallized acetate of lead and protosulphate of iron in water, and then filter out the precipitate of sulphate of lead produced by the double decomposition.

John Jones.—Prisms for use in producing reversed negatives are fitted into tubes to fit the tube of the lens The object must, of course, be parallel to the reflecting surface of the prism, which is at right angles with the lens. There are simpler modes of securing reversed negatives now, and some of these are generally used.

J. J. Fagan.—Captain Abney's Instruction Book will be ready in a few weeks.

Leo.—You will find in our back volumes various articles on each of the processes you mention, and also many articles upon each in our various Year-Books. Of course we cannot repeat the formulæ in this column. A search through the indexes of the various volumes will aid you in finding the articles.

T. E. H.—The green tint in your nitrate of silver is due to the presence of copper with which many samples of commercial silver are alloyed. Its presence is not generally injurious in a printing bath; but you may remove it, if you wish, by precipitating the silver as a chloride, and then reducing it again to the metallic state. Are you sure that you got rid of excess of nitric acid before making your nitrate of silver into a printing bath? The presence of nitric acid is more likely to make the prints poor in colour than the presence of copper.

J. H. W.—Thanks. The prints have not yet arrived.

B. L. F.—Various methods have been proposed and tried for restoring the sensitiveness of old collodion, but without much advantage. The best and simplest plan to use it up is to mix it in suitable proportion with new unripe collodion. This often effects an improvement in both.

Upside Down.—The spots on your print are caused by the particles of bronze from the bronze printing at the back and front of the card. See a leader in our next number.

H. W. Arnaud.—Many thanks.

Several Correspondents in our next.

The Photographic News, October 13, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

The Sale of Secret Processes—The Electric Light in Lighthouses.

The Sale of Secret Processes.—The rage for secret processes is not likely to abate. The love for anything mysterious is so deeply rooted in humanity that it would be useless to warn people from purchasing processes or methods of a confidential character. Our friend Dr. Vogel, of Berlin, has essayed the hopeless task, and has for some time time past preached against the foolishness of photographers to trust in strangers and buy any secret novelty offered for sale. We fear his labour is in vain. Not only do most people love the secret and mysterious, but they have a profound faith in strangers. A man will not heed the advice given by a surgeon who is his own brother, but will follow implicitly the directions given by a medical man who is unknown to him. It is the human failing to believe in "imported talent" that is the support of advertising. A photographer wants a better assistant than he possesses. His operator is all very well in his way; he can work with cleanliness, and take good, straightforward negatives, but has none of the *je ne sais quoi* that some of your men of the new foreign school possess. There are advertisements every day in the papers of competent assistants who can not only do as much as the operator you have, but can retouch negatives in the Berlin style, pose *a l'instar de* Salomon, and who understand all about *Fritz Luckardt's* system. These are the sort of men to get now-a-days to improve your indifferent prints, and make your plain matter-of-fact negatives go down with the public. And they advertise to come to you, it will be seen, for no more than what you now pay to Thompson Brown, who professes to no speciality whatever. One thing you usually find out sooner or later, if you do change your assistant, and that is that the new man knows how to advertise, if he is otherwise lacking in accomplishments. But we are diverging from the subject of secret processes, upon which we were going to say a few words. The main thing, so it seems, in secret processes, is to ask a good round sum, at any rate in the public announcements. Then when you begin to get a *clientelle*—never mind whether they pay what you publicly ask, or no—the matter goes on by itself. Half the purchasers make something out of the secret, or think they do, which is the same thing, for your process may be a very good thing in itself, although it is not new; and the other half, if they don't happen to succeed, will at any rate take care not to let anybody know of their failure, or indeed of their ever having purchased the secret. The latest secret process announced may be purchased, we hear, for the trifling sum of 100,000 roubles. Five thousand, we are told, have already been bidden for the prize by several bartering applicants, but the discoverer very justly will have none of them. One hundred thousand roubles down, or the secret will never pass the inventor's lips, is the announcement; so photographers with modest means who don't mean buying had better stand out of the way at once, and give place in the front row to their richer brethren who meditate business. One hundred thousand roubles is the up set price, remember, and be good enough, please, not to bid all at once. But we forget we have omitted to say what is the nature of the secret. We will give all the information we ourselves possess. The would-be seller is a Russian photographer residing at Nischni-Novgorod—we hope none are so ignorant as to stand in need of any clearer address—and he produces, it seems, group pictures which have very great depth of focus, by the aid of an ordinary lens: it is the secret of doing this that he is willing to sell at the sacrifice above named. The extraordinarily great demand for groups having considerable depth of focus has no doubt influenced the discoverer in fixing the sum mentioned, and as there seems to have been as yet no announcement of the sale in the journals of this country, we presume our Russian colleague has come to the patriotic conclusion of giving his brethren the first chance of purchase. Indeed, we scarcely know if we are in the right in letting the subject be known just now at all; it is true we are violating no confidence in making the statement, but still we may be spoiling the chance of anybody who may have been anxious about making a private arrangement, and thus saving the inventor the trouble of advertising. If such is the case, however, we need not be sorry, after all, for we cannot conceive anything more unjust than that one man should acquire the sole right of taking group pictures, with or without depth of focus, not because he has purchased it, but because he possessed the information that the process was for sale before his brethren were aware of the fact, and had time to rush in to secure it. Everybody deserves fair play, and we trust, therefore, that if the process is to be sold at all, all photographers alike will have the same chance of bidding for it. Let the secret of how to take deep focus groups be put up for auction in a commercial manner, in the same way as they do diamonds and gold nuggets, when they find them. We protest against any other mode of dealing, as un-English—a very good word, by the way, the meaning of which, however, we hope we shall not be called upon to explain.

The Electric Light in Lighthouses.—The electric light has at last secured a permanent footing, if only in one direction. It is now nearly eight years since Professor Holmes superintended the erection of an electric lamp at the South Foreland Lighthouse, and since that time the spark has shone out brightly across the waters of the Channel every night without interruption. Unfortunately, the cost of the light renders it impossible—at any rate, at present—to employ the same source of illumination in all our lighthouses, for the mere fact that a powerful steam engine is necessary to keep the magneto-electric machine in action shows that the maintenance of the electric light is an expensive affair. An engineer and stokers are necessary adjuncts to an electric lighthouse; so that at least double the ordinary staff is requisite. It was this expense of the steam-power more especially which put the electric light out of the domain of the photographer, who, some ten or twelve years ago, was sanguine about being able to make use of this means of illumination in place of the sun in bad weather. Already, however, considerable improvements have been made in electric apparatus since that time; and an intense electric light may to-day be secured with an expenditure of far less physical energy than was the case a few years ago.

ON A NEW APPLICATION OF SENSITIVE NEGATIVE TISSUE.

BY LEON WARNERKE.*

The new application I intend to submit to the notice of this Society is a mode of producing combination negatives applicable to almost every class of photographic production. It is based on the special facility the tissue negative possesses to be joined together; but, unlike the system lately described of producing panoramic negatives by joining various sections of the panorama edge to edge, I join them for the purpose face to face, or I superpose two, three, or any number of the images to form the desired combination. It involves the necessity of producing a positive transparency, which is printed again (using the tissue in both instances), and reproduces the negative with all the alterations, additions, or subtractions.

Before I proceed further I will make some observations on the reproduction of the negatives. It is a recognized fact that negatives cannot be reproduced equal to the

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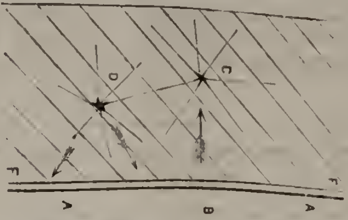
munication to the South London Photographic Society.

original by means of the collodion glass plate, wet or dry, either in the camera or by contact printing. The reason of this I attribute to the diffusion of light in the thickness of the glass, which I shall endeavour to explain by means of the following diagram. Here is represented a section of the glass plate covered with sensitive collodion *f*; *a a* represent an opaque portion of the negative destined to intercept the light, while C is the transparent part. The light acting in the direction of the arrow will affect the sensitive surface situated beneath C; but the sensitive coating *f* not being opaque it will penetrate it, and will illuminate the glass supporting the sensitive film. Reaching the opposite surface it will be partly reflected from it, backwards; and, although this reflection is a highly distorting element, I eliminate it from the present discussion, because it can be prevented by the non-actinic backing of the glass plate.



Before the light reaches the back surface of the glass it will illuminate the multitudinous particles forming the body of the glass. Each of those particles, *c*, becoming luminous, will shine in all directions, and will illuminate the neighbouring particles, *d*, which, in their turn, will affect the sensitive surface from the glass side; then the place that was protected by the opaque part *a* from direct light is now exposed to the reflected light, which, although a great deal weaker than the direct light, will, nevertheless, tell its tale, altering undesirably the relation of the gradation of shades. This, according to my idea, is the reason of the impossibility of reproducing the negative correctly on the glass plate.

The sensitive tissue, by its extreme thinness, and by the absence of a polished back surface, is free from this defect, and for this reason is admirably suitable for the reproduction of a negative possessing, unaltered, the quality of the original.

In this place I may notice that the magnificent carbon transparencies produced by the Autotype Company for subsequent enlargement owe their recognised superiority over silver transparencies to the very same cause—namely, the carbon tissue on which they are printed, like my own sensitive negative tissue, has no glass support, with its inevitable reflection and diffusion of the light.

Having thus theoretically given the reason of the advantage of using the tissue for the intended purpose, I shall practically demonstrate the advantage gained by the facility with which I can multiply various combination effects, by superposing several films bearing separate portions of the final combination, the thinness of each film being the reason why the combined pictures neither lose in sharpness or transparency.

Beginning thus with a landscape subject: the original negative, as is usually the case, will represent the sky when printed as white paper. A great improvement will be conferred by reproducing this negative with clouds, and this is done in the following manner:—First the transparency is printed on the tissue, taking care to secure the sky perfectly transparent. Another transparency is produced from the cloud negative, having perfectly transparent all the space corresponding with the landscape outline, which is easily done by inserting between the cloud negative and the sensitive tissue a paper mask cut out from the sheet of albuminised sensitive paper, after printing it behind the landscape negative, cutting out with scissors or knife the part representing the sky, and blackening it subsequently by light. Two transparencies thus produced will, when superposed, form a new one, which, when printed in contact on a fresh sheet of the sensitive tissue or copied in the camera, will produce a negative either the same size or diminished or enlarged, which naturally will give a print on paper, or otherwise, equal to the original in quality; but having the sky represented by clouds instead of white paper, and reflecting the artistic feeling of the manipulator displayed in the choice of the suitable cloud subject, and in giving them proper intensity or gradation of intensity.

My next illustration is the application of the same system to a portrait negative. By examining the combination which I now submit for inspection you will observe that it is formed from three films—the first bearing a representation of the ornamental moulded frame of oval shape, with space outside and inside left quite transparent; the second film has the impression of the tinted ground with light white lines, and white letterings, representing the name of the subject or artist, &c., with transparent space left for subjects of first and third films. This last one bears the portrait fitting exactly the frame of the first film, but transparent in other parts. Superposed transparencies are printed as usual. The resulting print will possess in high degree the advantage of combination; besides this, the size of the picture gains in magnitude; the small card portrait fills now a 10 by 8 plate without being enlarged. The other portrait shows a different combination, which can be varied without end.

Magic lantern and stereoscopic slides can be also very much improved by the application of the same system. In stereoscopic prints, especially, an important improvement is introduced by adding stereoscopic transparency of the ornamental frame, which, being taken at the much nearer distance than the principal subject, will appear also much nearer to the observer, enhancing by this means the solid aspect to an extent till now unknown. The same method is applicable to the production of combined negatives, line engraving, or drawing; and insertion of the printed or written inscription for subsequent photo-mechanical printing is self-evident.

THE ZINCOGRAPHIC PROCESS.*

In the following paper I desire to bring forward the results of a fifteen years' experience of the zincographic process, or, in other words, of the production of linear sketches by etching upon zinc. But in the first place I must remark that etching in relief, so easy as it seems at first sight, requires a long apprenticeship, and for this reason it is only a few experimenters who succeed in producing results as are now-a-days required. Especially is it difficult for those to succeed who possess no knowledge of any kind of the printing process, and even a type-printer will find greater difficulties in his path than a lithographer.

To be a good zincographic worker, one should have a knowledge of type and lithographic printing, to begin with, as the process of transferring and other manipulations fall in the province of the lithographer, and require already considerable tact and skill, while, again, the intelligent eye of the type-printer is necessary to watch the subsequent operations, and to say in the end whether it is possible to print from the finished plate.

These remarks are of particular weight, I can assure my readers, and show at once what preparation is necessary for successful working. In any case, I consider it absolutely necessary that the experimenter leave the transferring in the hands of a skilled printer, merely remarking that a lithographic or copper-plate press must be used for pulling the prints.

The Polishing of the Zinc Plates.—Zinc plates which have a thickness of about three millimetres are best suited for the purpose. After the edges have been smoothed with a file, the plates are put upon an even plank, which is nailed at the edges, so that the heads of the nails keep the plate down to the wood. A blade or scraper of the best steel, which possesses a certain amount of elasticity, is next drawn with one motion over the plate; and this operation is repeated until the surface is quite uniform, and even a good many bubbles and flaws being removed in the work. These defects must not be removed by scraping away at such portions of the plate where they present themselves, but the scraping operation must be proceeded with uniformly, the blade being drawn across the whole surface of the zinc, otherwise hollows will result which will subsequently mar the printing qualities of the plate.

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* *Photographische Correspondenz.*

When the plate has been scraped as evenly as possible with the blade, it will still be found to have many streaks and fissures. The plate must now be rubbed with soft pumice-stone, which has first of all been filed to give it a rasping surface; water is employed with the pumice, and the surface rubbed until all inequalities disappear and the zinc has a uniform matt appearance. When this stage has been reached, the plate is washed with water and dried with a linen rag, and then taken from the board, and transferred to some other even basis. It is now rubbed in a rotatory manner with fine emery paper, until the plate appears almost polished. In this condition the plate is then put away between sheets of paper for use.

If, however, the plate remain some time before the transfer is made, say four or five days, then it is necessary to rub it once more with emery paper.

I should here remark, by the way, that great care must be exercised not to touch the plate with one's fingers; in such places either the transfer will not adhere, or there appear black patches as soon as the inking up of the image begins. Indeed, the ink will adhere more tenaciously in these places very often than to the image itself.

To Transfer upon Zinc.—As is well known, transfer ink may be made up in various ways. As a rule, that which finds most favour with the lithographer is an ink composed of—

Tallow	2 parts
Resin...	1 part
Shellac	2 parts
Venetian turpentine	1 part
Lampblack	2 parts

In order, however, to render this suitable for etching in relief upon zinc, it is requisite that there should further be added one part of yellow wax and one part of Burgundy pitch. These ingredients are melted in an iron pot over a charcoal fire, and the mass then rubbed upon a slab with about one-third ordinary light varnish, which renders the ink easily manipulated by the printer.

If, however, a photo-lithographic picture is to be transferred direct from photographically prepared paper, then the preparation of the paper must have been undertaken with a much thicker ink, as otherwise the latter will not attach itself well to the zinc, or the fine details will be found to fuse into one another in such a manner that the prints are useless. I must remark, indeed, that I presuppose the zincographic worker to be acquainted with the photo-lithographic process.

In reference to the so-called transfer paper upon which the images are produced in order to be transferred to the zinc plate, I would say that the best description to be employed is that termed doubly-coated chalk transfer paper, which is to be obtained of any dealer in lithographic wares.

The image, sharp in every part, and not overladen with ink, is placed in moist paper, and when it has become damp and supple it is carefully laid upon the perfectly clean zinc surface, and covered with a sheet of glazed paper, after which it is passed through the press. This operation must be repeated several times in order that the image may become attached in every part to the zinc plate. Afterwards, the back of the transfer paper is moistened with water, and in this way the paper, after a time, removed. It matters little whether this paper backing is removed in one sheet or in fragments; but in any case, a great deal of water should be used, as the rinsings are contaminated by the chalk dissolving away.

Transfer paper which is prepared with starch, gum, or gutta-percha, is more easily removed from the zinc, but, on the other hand, the operation of transferring is more difficult.

As soon as all the transfer paper has been removed from the zinc surface, and the latter has been well washed, you proceed to invigorate the image upon the plate.

(*To be continued.*)

THE RETOUCHING OF PORTRAIT NEGATIVES.*

The Mouth.—The mouth, by reason of its extreme mobility and the elevation and depression of its angles, as well as its greater or less length, forms the principal index of exterior emotions. It is for this reason that the retoucher must give the feature his especial attention.

If the model has a thick moustache which produces a shadow, it is well to accentuate the feature, which otherwise will appear too hard.

Any tiny fissures that may appear in the lips should be worked out. The form of the mouth may be much beautified by retouching the outlines of the lips and rendering them more regular.

If the model is of an advanced age, the falling mouth forms two furrows which are strongly marked at each side; these must be softened. Do not remove, however, the commissure of the lips, as otherwise the mouth will appear pinched up. The lower lip must be lightened up a bit, as it is nearly always rendered too dark.

The Eye.—The eye is so important a part of the model that the photographer, in posing, pays very great attention to it, and instructs the model as to the direction in which he should look.

Nevertheless, in many instances, the retoucher may work with advantage. The glance of the model, usually clear and calm, often darkens at the commencement of the exposure; the lids and pupils lower, and the brightness of the upper part of the eyes is consequently much diminished.

This defect may be easily remedied by indicating upon the negative the margin of the eyes. This holds good especially in the case of models with blue eyes. It also happens very often that the luminous spot of the eye placed in the shadow is represented more powerfully than that which is in the lighted-up part of the face. In this case it is necessary, of course, to equalise the tint of those two luminous points.

The same defect is to be often observed in the lower margin of the eyes; here you will nearly always find the light more vivid than the tone of the white of the eye. Strengthen and make clear wherever it is necessary, but act with prudence.

In the whites of the eyes, and especially in the case of persons of an advanced age, there are to be observed little veins, which, in the negative, have the appearance of small spots or patches. These should be suppressed, taking care, however, not to render the white of the eye too bright and clear.

Next, as to the part surrounding the eyes. In the first place, that portion of the face just above the eyes is almost always too dark. The folds just above the lids must be lightened up a little. Again, below the eyes, there are parts rendered too darkly. Here the folds or creases in the skin should also be softened, especially in the case of models of advanced age, in which they appear of a very decided character.

As regards the markings or "crow's feet" to be seen in the corners of the eyes, they are generally too characteristic to be suppressed altogether, and caution must, therefore, be used in dealing with them.

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* Continued from page 472.

ON A NEW METHOD OF NEGATIVE RETOUCHING.

BY BARON STILLFRIED, OF YOKOHAMA.*

I have much pleasure in communicating a process which I employ in the retouching of negatives, in the hope that some of your colleagues may be induced to try it and further improve it.

In the first place I may remark that I never intensify, and this I take to be a great technical advantage, and any lack of contrast is compensated for by very energetic means of retouching. The principle of the latter consists in "graining" the film of varnish, and in employing a stump and graphite.

The negative is covered with a thick varnish; if this is too thin the negative may easily be spoilt in the "graining" process, and for this reason it is better to apply a second film of varnish.

After the varnish has become hardened, I grain it by means of Japanese tooth powder, which is nothing else but pumice-stone, and therefore is very easy to obtain. I lay the negative in a horizontal position with the varnish side uppermost, and put a sufficient quantity of the powder upon it and then rub away with a leather pad in a rotatory manner, in the same way precisely (only of course with a much lighter hand) as when you are graining a lithographic stone. The powder must be often changed, as after rubbing for some time it gets mixed with particles of varnish, and then refuses to impart a fine grain.

Next the actual retouching is taken in hand, and in the first place the lights are treated with the leather stump rubbed in graphite. Large surfaces may in this way be treated at a time, and thus the task of covering from the back is avoided, a plan which, as every practical photographer knows, has its shady side. You must avoid pressing too hard upon the stump, as the varnish film will then become smooth again, and cannot be attacked by the pencil subsequently.

After this the negative is worked upon in the ordinary manner with a lead pencil. I employ Faber's Nos. 2, 3, and 4, and in isolated cases—in the case of large heads, for instance—No. 1 is used to bring out details in the beard and whiskers.

The success that attends the working-up of negatives in this way is quite surprising, even when under-exposed and defective plates are manipulated, and for this reason I enjoin my colleagues to try the plan.

Any more particulars will doubtless be considered superfluous, for every retoucher will understand the matter after he has once tried it.

A FEW WORDS ON LITHOGRAPHY.

BY M. G. FORTIER.†

Without entering into long details respecting the operations involved in lithography and the materials necessary to be employed, which scarcely enter into the domain of this work, I will indicate the *modus operandi* to secure a good transfer or image upon stone, after a gelatine print faced with putty ink has been obtained by photography. (See our previous article on M. Fortier's work, page 474).

Theory of the Lithographic Process.—The printing of the prints being altogether purely lithographic work, the amateur or professional photographer will always do well to have the work done by a trained lithographer. The theory of the process is as follows:—When a design is made upon a lithographic stone by the aid of a greasy body, whether liquid or solid, it adheres tenaciously to the stone. If a sponge moistened with water be passed over this stone, the water is absorbed only by those parts which are not covered with grease. In passing, therefore, a roller charged with greasy ink over such a design on stone, the ink is attached only to the greasy line, and is repelled by the damp stone surface.

It is sought, for this reason, to render the stone more susceptible to moisture, and induce it to retain water for a longer period; acids produce this effect by augmenting the porosity of the stone and gum, which is indispensable in lithography; combining with the stone prevents the greasy matter from spreading, and at the same time gives the stone a greater tendency to absorb water wherever it is uncovered.

If you take a stone, wet it all over, and pass an inked roller over its surface, it will not take up any ink so long as it remains damp; but allow it to dry in parts, and the ink at once adheres.

The whole theory of lithography may be reduced to this. Trace upon a stone, by the aid of a greasy or bituminous body, any design whatever, treat it with a mixture of very dilute acid and gum water by means of a sponge, and while it is thus damp and wet pass over the whole a roller with printer's ink. There will soon be a sympathy between the fatty matter on the stone and the ink upon the roller, and the latter adheres to the design, while moisture, which covers the rest of the stone, prevents the adhesion of ink anywhere else.

Lithographic Stones.—The stones best adapted to the purpose are those of Munich, and to get at the quality of a stone it is sufficient to pass over it a wet sponge; if the water is absorbed immediately, the stone is too tender; while if, on the contrary, the moisture remains upon the surface too long a time, then the stone is too hard. Any impurities in the stone become apparent at this moment. In making choice, stone should be selected of close texture, very homogeneous, and exempt from veins and spots.

Lithographic stones are to be purchased already dressed, and it only remains to polish them to fit them for work. To do this, they are powdered over with very fine sand which has been passed through sieve No. 100, and after working, a second stone of the same nature is placed above the first. The upper stone is then moved backwards and forwards, or with a rotatory motion; on no account, however, must the upper plate exceed the lower one in size, as otherwise plane surfaces will never be produced. In this way the whole of the sand is used up, and then the stones are washed to remove the fine grains of sand and any impurities which may remain attached to the sides, and which would, if not removed, scratch the stone in subsequent operations.

The polishing of the stone is carried out by means of pumice-stone; the stone is wetted, and then rubbed by passing a piece of pumice to and fro over its surface, the pumice being dipped frequently into a vessel of water to detach any minute fragments of stone that are detached.

Transfer Paper.—In lithography this paper is frequently employed for transferring a print freshly pulled, whether by lithography, typography, or engraving, to stone, and thus placing several images upon the same surface. Thin india paper sized two or three times is generally employed for this purpose. A lithographic press is absolutely necessary for the production of prints, the little amateur presses that are made being quite insufficient for the purpose.

Lithographic Ink.—This is to be purchased in commerce already made up, and may thus be obtained by the photo-lithographer without difficulty. But it is generally of too dry or hard a description when produced, and requires to be diluted with varnish for ordinary printing purposes, or a little salt in case it is to be employed for transfer, a knife or spatula being employed for mixing. Any retouching that may be necessary upon the stone is done with an ink specially made up, and this ink is to be obtained in commerce in the form of sticks. To render it fit for use, it is rubbed with a few drops of water, and will remain liquid for some time.

Lithographic Rollers.—Lithographic rollers are also to be purchased, but they are not produced by simple manufacture. It is impossible to employ a perfectly new roller, and therefore such as are purchasable have to be specially prepared. They must be so well impregnated with fatty matter as to be capable of repelling moisture, and this is only done by rolling them for some days upon an ink table which has been first of all treated with varnish, taking care to scrape them frequently with the knife or spatula, and to renew the ink and varnish on the table. This must be done often and at intervals of several days in order to get a good roller. It is best, therefore, for the amateur to procure for himself a roller already made.

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* *Photographische Correspondenz.*

† *La Photo-lithographie, son Origine, &c.*

When a good roller has been obtained, every care should be exercised to keep it from dust.

There are also rollers of gelatine to be purchased, and these are to be recommended for inking up gelatined paper.

In order that you may work well at lithography, it is absolutely necessary that everything about the lithographic press should be kept in good order, the press itself in sound condition, the scraper perfectly level, and the leather tympan well pressed and pliant.

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THE PROGRESS OF PHOTOGRAPHY AS DEPICTED BY THE FRENCH PHOTOGRAPHIC EXHIBITION.

BY M. DAVANNE.

The Exhibition organized this year at the *Palais de la Industrie* under the auspices of the French Photographic Society is certainly the most important of all that have preceded it, less perhaps on account of the number of exhibitors (which, however, exceeded that of any previous exhibition) than by the great variety of works admitted, by their interest, and especially by the influence that they will have in the future. We have proofs that the circle of photographic applications is still increasing, and that photography, although so imperfectly known, and consequently so imperfectly appreciated, by a public who only sees one side of it, may be considered as one of the most marvellous and useful inventions of the present century. Like steam and electricity, it takes its part, although it may be a more modest one, in the progress of scientific applications to our comfort and our instruction; it also aids in the execution of peaceful work, and assists in our various studies.

The Paris Exhibition of this year has shown us examples of every aim and result of photography, and I am therefore in a position to point to a number of important applications other than those which are most often before the public.

We will examine photography successively in connection with great public services, with the study of science, the arts, and industries, and we shall see that wherever it is made use of, it soon becomes indispensable, and for this reason: it searches out the truth, the most intricate of details, the most rapid of results; it is the new method, and will soon be the only one, employed to reproduce and register everything that light makes visible to our eyes.

Before, however, proceeding to the examination of the various applications, let us first of all turn to the present condition of photography, and show by the aid of the picture exhibited what we demand of photography, and what we obtain.

If we examine, in the first place, the negative, or cliché, which is the intermediate means for producing results, we may affirm that, judging from the large works of M. Huguemin, M. Lampue, and M. Naya, that clichés of great dimensions may be secured, exceeding a metre square, which still possess all the fineness and detail that are necessary; and if the manipulations impose a limit upon the size at all, that limit has not yet been reached. On the other hand, again, we may arrive at results of the most microscopic character, such as could not be produced by any other means, as witness the images secured by M. Dagron, who reproduces three columns of text upon a surface measuring less than a square millimetre, the type being still very clear and legible with the assistance of a powerful magnifier.

Again, the camera is able to give the infinitely small made infinitely great, the micro-photographs of M. Ravet having some of them been produced by enlarging 1,500 diameters, or, in other words, increasing a surface 2,250,000 times.

Next, coming to the rapidity with which the photographic image is produced, we find this varies according to the preparations, the optical apparatus, and the subject to be reproduced. The large pictures of the sun taken by M. Janssen were produced in less than $\frac{1}{100}$ of a second. There is still much improvement to be made in this direction, but, at any rate, the sensitiveness already secured is something wonderful.

Quitting the laboratory to examine the definite result, or, in other words, the positive image, we have to report progress which leaves no doubt as to the grand future of photography. The art has been reproached, with some justice, on account of the liability of its result to perish rapidly; further, that it yields works which are not uniform in character, that its manipulations are slow and costly, that it is in some way an isolated industry, and that it cannot on this account be allied with ordinary graphical arts which produce imperishable, uniform, rapid, and cheap work.

The putting into practice of some of the more recent discoveries, due for the most part to M. Poitevin, must be considered as annulling nearly all these reproaches. At the present moment the so-called carbon process gives permanent prints, like those which were shown by MM. Braun, Halley, Liébert, Pector, &c.; the prints produced by the Photoglyptic or Woodbury process yields *mechanically* the most beautiful prints, such as M. Rousselon has shown in one portion of the exhibition. Other methods transform the negative into copper or steel engravings, which furnished, by the ordinary means of printing, an indefinite number of imperishable prints in a rapid and economical manner. Examples of this kind of printing may be found by hundreds in the collections of M. Rousselon, M. Scamonie, M. Franz, and that forwarded by the Portuguese Government. These same clichés may be printed upon surfaces of gelatine in the same way as in the lithographic process, and furnish inalterable images in greasy ink upon stone, zinc, copper, and every other plane surface. Finally, every line engraving may be transformed by photography into a typographic block, replacing the wood-cut, and capable of being printed with type in the case of illustrated books. M. Rodrigues, MM. Gillot et Fils, M. G. Fortier, and others have shown successful work in this direction.

We may therefore regard it as an accomplished fact, proved by the specimens exhibited at this exhibition, that photography may be transformed into engraved or relief-plates, into lithographic blocks, or, if desired, images may even be secured by light-printing, now-a-days, of a permanent and solid character. If some surprise is felt for the tardiness with which these processes are adopted, we may reply once more, that the time and skill necessary for the introduction of all practical novelties are considerable. In order to secure results equal or superior to those produced by industrial arts already in existence, it is necessary to train special workmen, to combine the skill of the photographer with that of the printer, and all this takes time. Progress of this kind can only penetrate slowly, from the fact that it is a long time before things now existing can be upset and superseded.

M. Davanne then proceeds to consider *seriatim* the various applications to science and the arts represented by the collection of pictures in the *Palais de l'Industrie* this year, and points, among other things, to the great assistance which photography lends to the study of science at the present day.

The Photographic News.

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YELLOW SPOTS IN PRINTS.

A curious cause of irregular yellow spots in prints has recently been brought under our attention by a correspondent. For some months past his prints had been subject, at irregular periods, to attacks of spots, chiefly yellow, sometimes black and brown, and occasionally inclining to green. As the prints came under the attention of our correspondent generally after they were mounted, he did not ascertain at first at what stage in their production the defects appeared. All the known and recently discussed remedies were tried in turn. Never having been troubled with this defect before, he was little familiar with the subject, but read up carefully all that had been published on the subject in our pages during the last two or three years. Samples of paper were changed; a few bronze-printed mounts, which had recently been received as an experiment, were destroyed; especial care in fixing to remove minute air-bells was urged on the printer, and injunctions issued against using acetic acid in the washing waters before toning. At times the spots would almost cease to appear, and hope was entertained that the cause of the evil had been eliminated. In a few days, however, the spots appeared as bad as ever; and this continued throughout the whole summer.

Our correspondent appealed to us several times, but we could only suggest the usual causes and remedies. A somewhat similar case once came under our attention, when, after some weeks of great anxiety and constant research, the enemy was discovered in a coke fire in the printing room, the sulphurous particles emitted from which covered the prints with yellow spots. This cause was not to the purpose here, for being summer time no fire was burnt, and the most plentiful crop of spots seemed to come in warm, dry weather. We mentioned another case in which spots similarly pestered a photographer who eventually got rid of them by removing all the printing operations to another room. The mention of this case suggested to our correspondent the idea of devoting a few days to a thorough personal overhauling of the printing room and printing operations. His first discovery was an important one. He found that the spots were generally faintly, and sometimes very clearly, visible before fixing, sometimes even before printing, sometimes whilst rinsing before toning, and at other times before immersion in the hypo. His first conjecture, based upon this observation, was that the fault was in the paper or silver bath. Fresh paper and new silver bath, however, gave similar results, and these were clearly not at fault. In his search through our pages for remedies, he met with an article on the occasional injury arising from the dust of chemicals in operating rooms, and he remembered that these troublers of his peace were most rife in dry, warm weather. He, too, resolved to try printing operations in another apartment. A small equipment of printing materials was removed to his own room, duly darkened for the occasion. The experiment was in every way satisfactory: no trace of the unwelcome spots appeared—they were clearly due to something in the printing room itself. It is not necessary to dwell upon the case further in detail. Our correspondent, who had rarely gone into his printing room himself, found now on examination and enquiry that it had been kept in a very slovenly state; the floor rarely washed; hypo solution and other solutions carelessly handled, and not unfrequently spilled on the floor. The issue was that the dust induced to fly about in hot weather consisted of a variety of chemicals, including hyposulphite of soda, hyposulphite of silver, sulphides, and other deleterious substances. A very thorough cleansing, and the enforcement of a rigid reform, have for the present banished the varied spots and ended the trouble. It is not necessary for us to offer comments. The lesson involved is very apparent. *Verbum sap.*

Whilst referring to the general subject, we may offer a word or two of comment upon the remark of "Snowstorm" in a recent issue. "Snowstorm" objects to the notion that bronze printing is a cause of spots, because some mounted on cards with bronze printing remain without spot. He thinks that if bronze printing were the cause, all prints mounted on cards with such printing must necessarily become spotted. The argument appears plausible, but it is really without weight. In the first place, all bronze powders are not prepared in the same way, and do not consist of the same material; and this fact would account for their different action. As, however, there is generally more or less of secrecy in their manufacture, it would be difficult to obtain sufficient information to guard against the use of injurious samples. But we do not lay much stress upon the fact we have mentioned as a cause of varied action. We believe that the bronze powders used in printing card mounts are almost universally injurious. The reason why every print mounted upon such cards does not become spotted is obvious enough. The photograph is not injured by being mounted upon a card with bronze printing at the back; but by being smeared with loose particles of this bronze by coming into contact with the backs of other cards where this bronze printing is present. In some cases these particles are firmly bound by the sizing matter in which they are embedded; in other cases they are lossely on the surface, and readily rubbed off by the slightest abrasion. The proof, however, that these particles do produce the yellow spots in question is easily obtained: it is only necessary to place a damp print in contact with the bronze printing, and watch the effect in a day or two. We have examples in which the entire printing at the back of a card is reproduced in dirty yellow on the face of a print which was placed for a short time in contact with it. Let our correspondents and other doubters test the matter for themselves.*

THE DANGERS OF TEMPERED GLASS.

The advantages offered by the toughened glass of M. de la Bastie seemed to be very definite, and very important to all frequently using glass vessels, and especially so to photographers. To be able to secure the cleanliness and convenience of glass baths and glass dishes for various purposes, and possess at the same time immunity from the ordinary risk of breakage, was naturally regarded as a boon to be rendered available in the operating-room without delay. An experience related in our daily contemporaries by Mrs. Nassau Senior effectually dashes these hopes to the ground. Mrs. Senior says that on the 11th of last month she furnished twelve gas-burners with tempered glass globes purchased in London, and having the veritable label of M. de la Bastie affixed to each. Two of these globes were fitted on burners in her bedroom, and on the night of the 6th inst., after the gas had been extinguished for exactly an hour, one of the globes burst with a report and fell in pieces on the floor, leaving the bottom ring still on the burner. These pieces, which were, of course, found to be perfectly cold, were some two or three inches long and an inch or so wide. Curiously enough, they continued for an hour or more splitting up and subdividing themselves into smaller and still smaller fragments, each split being accompanied by a slight report, until at length there was not a fragment larger than a hazel nut, and the greater part of the glass was in pieces of about the size of a pea, and of a crystalline form. In the morning it was found that the rim had fallen from the burner to the floor in atoms.

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* Since these remarks were in type, we have received a letter singularly corroborative. See our Correspondence pages.

Another correspondent writes to the same effect, remarking, "My experience of tempered glass is much the same as Mrs. Nassau Senior's. I purchased six tumblers made by a London manufacturer. Five of them are perfect, and are as clear and as well made as any glasses can be; but the sixth crumbled to pieces like small diamonds. At the time it broke there was only cold water in it."

The latter experience is most important to photographers. A silver solution instead of cold water, and a glass bath instead of a tumbler, might under similar conditions produce very disastrous effects by a similar breakage. Dr. Diamond, writing to us on the subject, mentions the case of a barometer tube which he possessed many years ago, which was extra annealed by some analogous process, which, without touching, cracked, the portions being driven asunder to the extent of three-eighths of an inch. The moral is clear. Avoid tempered glass for holding valuable or dangerous solutions.

ELECTRO-MAGNETO-NEGATIVES.

A curious novelty was brought under the attention of the members of the Chicago Photographic Association. We give the details as reported in *Anthony's Bulletin*, and leave our readers to speculate on the phenomena it records. After the usual routine proceedings, Mr. Joshua Smith favoured those present with a very interesting exhibit of a new process, which he called the Electro-Magneto Process. He exhibited negatives, some of which were regular, others purposely undertimed, and some of lines. After they had been examined by all present, he proceeded to open the eyes of all. Taking one of the negatives, he immersed it in a solution for a few seconds; after washing he placed it in another solution which was in a glass bath dish, giving all a chance to see the disappearing process, which was done most effectually; for when the negative was removed from the bath and rinsed, there was apparently nothing to be seen that had the appearance of an image. He then flowed the plate with another solution, bringing back the likeness, and to just the point wished, claiming that, by putting them through solutions No. 1 and 2, and reducing them all (good and bad negatives) to the same level, then with solution No. 3 he can bring them up to excellent quality. He can make a solar negative of an intense harsh one, or make a splendid negative for contact printing from a solar. The negatives were all served the same, and pronounced by the many learned ones present superfine, the printing qualities being magnificent. The process as a whole was pronounced wonderful.

Mr. Hall enquired if it did not affect the film.

Mr. Smith rubbed the film side very hard with his finger, which showed very plainly they could be printed from without being varnished, if desired; consequently the film was even tougher than before.

After remarks by Messrs. Hall, Hesler, Klein, Ormsby, Douglass, Denslow, Cunningham, Shaw, Thompson, the President, Secretary, and others, upon motion of Mr. Douglass a vote of thanks was unanimously tendered Mr. Smith for his excellent entertainment, it being the wish of all to have Mr. S. favour at the next meeting with more of the same, which he promised to do. In answer to a question Mr. S. stated he had filed a caveat, which protected him for a year, giving him time to continue his experiments, which will probably result in his taking out a patent.

THE "ATHENÆUM" AND PHOTOGRAPHY.

Mr. H. Baden Pritchard writes to us as follows:—

"Your readers are not, I am sure, indifferent to novelties connected with photography, and for this reason I send you a cutting from the *Athenæum* which may amuse, if it does not instruct.

"The *Athenæum* is a journal of science as well as of literature, and it was very hard indeed on poor Professor Guthrie, the other day, because that gentleman had given it as his opinion that 'solid water' and 'water of crystallization' were not one and the same thing. As a matter of course, Mr. Guthrie had to succumb in the end before the trenchant critic, and the Professor retired under the withering sarcasm that he was 'sensational.'

"This week the *Athenæum*, in the most prominent part of its columns, presents us with a test for determining whether photo-zincographs are permanent. A series of Charters in the British Museum is, it appears, to be reproduced by the photo-zincographic process; 'this process,' the *Athenæum* says, 'was somewhat discredited by the unsatisfactory character of the fac-similes of Domesday, and one or two other publications, in which photo-zincography was adopted. But since then the *modus operandi* has been much improved, and, besides, photo-zincographs possess the great merit of durability.'

"As photo-zincographs, as everybody knows, are simply printed in a press, in the same way as ordinary lithographs, and, like these, are merely composed of ink and paper, it is scarcely obvious why a scientific journal should insist upon their possessing 'the great merit of durability.' We are enlightened, however, in the next sentence, for the *Athenæum* proceeds to tell how the durability of ordinary print and paper, in the form of photo-zincographs, may be tested. It says: 'For the purpose of testing the process with a view to this series of charters, fac-similes obtained by photo-zincography were boiled and kept in hot water for more than four hours, and came out of the ordeal quite uninjured.'

"I cannot help thinking that this was rather hard upon the photo-zincograph. How would the editor like his *Athenæum* 'boiled and kept in hot water for more than four hours'? I'm afraid that estimable journal would not wash under the circumstances, or come out of the ordeal 'quite uninjured'! But can you, sir, suggest any reason why, in the name of goodness, the experimentalist of the *Athenæum* should undertake this particular culinary operation? Did he suppose that the photo-zincograph would be good to eat after all this boiling and stewing, or what was his object? One can hardly believe he is confounding a photo-zincograph with a silver photograph, because even if the latter were 'boiled and kept in hot water for more than four hours,' it would be no test of its durability. When he says that 'the *modus operandi* has been much improved,' I suppose he means that some time ago the prints did not stand 'being boiled and kept in hot water for more than four hours.' In any case, sir, I think your readers will be much surprised to hear of a photo-zincograph being treated like a leg of mutton as a means of ascertaining its goodness.

"Will the *Athenæum*, in the interests of its readers, allow me to say that there is as much sense in adducing the fact that a photo-zincograph has been 'boiled' in support of its durability, as there would be in telling its readers that it had been roasted?"

THE PHOTOGRAPHIC EXHIBITION.

During the last few years the process of enlargement appears to have reached the highest possible stage of perfection, and the examples at the present exhibition leave nothing to be desired, except, possibly, a little more variety of style. The majority of the examples being produced by the same process, and probably, indeed, in many cases by the same persons, no matter by whom they are sent for exhibition, inevitably militates against variety of style and effect. All the enlargements exhibited are, moreover, if we mistake not, practically produced by the same method, which has now superseded for general use all the other modes at one time in use. A transparency is produced from the original negative, generally on carbon tissue, and from this an enlarged negative is obtained, which may be printed by any method, the majority of the examples in the present exhibition being printed in carbon. This method of enlargement permits retouching at four stages: on the original negative, on the transparency, on the enlarged negative, and on the print; very slight retouching, judiciously applied at each stage, facilitates the production of very fine pictures, with little appearance of elaborate retouching. The enlargements contributed by the Royal Engineers, which are very fine indeed, are, however, produced in another way worked out by Captain Abney last year. In this case an enlarged transparency is produced from the original negative, and from this a negative is obtained by contact printing on a dry plate. Of solar camera printing, or, indeed, of development printing on paper of any kind, we have no examples, except those exhibited by Mr. J. H. C. Harrison, which were produced some years ago, and are exhibited as illustrations of the permanency of prints produced by the Calotype method.

The Autotype Company are this year, as they have been for some years past, the most extensive exhibitors of enlargements. They send upwards of a score of magnificent pictures, many of them over four feet, and apparently as minutely perfect as a card picture. It is needless to characterise special pictures where there is such uniformity of excellence. The interest attaching to the subject of each picture will probably determine the amount of attention each will receive, rather than any varieties of excellence in the execution. Here, attracting admiration, is the fine head of Dr. Russell, better remembered as William Howard Russell, the "Pen of the War" upwards of twenty years ago. The Crown Prince of Germany, and his wife, the Crown Princess, eldest child of England's royal house, but grown singularly unlike the family; the Queen, and the Princess of Wales, very large, and very admirable examples, also attract much attention. So similar in style and in excellence, that reference to the catalogue alone enables us to make the distinction, are the enlargements contributed by the Woodbury Company. Possibly, if there be a distinction, it may be found in a singular delicacy and refinement in many of their specimens of both portraiture and architecture. Of the latter class, No. 88, "Courtyard, Alcazar, Seville," is a fine example. In portraiture, Sir Garnet Wolsey, Cardinal Manning, and J. E. Millais, R.A., are exceedingly fine examples. An untouched enlargement of a pretty child, by Mr. W. Cobb, is a very charming picture. A very interesting example is sent by Mr. B. B. Turner, whose calotypes in the earliest photographic exhibitions were always admirable. This is a very good enlargement from a calotype negative of some hedge-row trees in Worcestershire. The enlargements of the Royal Engineers, are very excellent, as are some exhibited by Boucher, Lombardi, and others.

There are some good examples of copying and reproduction in the present exhibition. Amongst the most interesting are the reproductions by the Autotype Company of Mrs. Cameron's pictures. In these cases, the original negatives having been destroyed, the Autotype Company have undertaken their reproduction from paper prints, and succeeded most admirably. Indeed, in some cases we should be tempted to say some amelioration had been made which produced a better effect than the originals, traces of slovenly manipulation, which often marred otherwise really fine pictures, being absent here. The same company exhibit some capital copies of engravings and paintings. No. 239, "The House of Peers," from a painting by F. Sergeant, is interesting as a picture apparently produced largely by the aid of photography. The likenesses are admirable, and have probably been produced from photographs, a defect common to such pictures being only too manifest: the heads, varied enough in pose, are in almost every instance turned in any direction but that of the Speaker, who is addressing the House. Nevertheless, in this, and in many other examples, we have admirable illustration of the value of photography, especially when printed in carbon, as a substitute for engraving. Take the "Romeo and Juliet" of F. Maddox Browne, a picture in which the absolute preservation of the style and touch of the painter is of vital importance. In it we have all the advantage of multiplication of copies; but it is rather in the form of reproduction in monochrome than of translation through the medium of engraving. In the difference between the two methods in such a case, it is all gain and no loss. The difference in cost, and the rapidity with which copies can be produced, are all of vital importance in favour of photography.

To many other excellent examples of copying and reproduction we must refer in our next.

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PRIZES AT THE AMERICAN INTERNATIONAL EXHIBITION.

As the number of English contributors to the exhibition at Philadelphia was very limited, the proportion of medals is very large, numbering, in fact, about half that of the contributors. The following awards in connection with English photography have been made:—W. Bedford, Robinson and Cherrill, Julia M. Cameron, Vernon Heath, Col. Stuart Wortley, London Stereoscopic Company, Payne Jennings, A. H. Henderson, Carl Norman, Frederick York, Frederick Hudson. All these are described as for photographs. For photographic apparatus and appliance we find but one award, that is to J. H. Dallmeyer, for photographic lenses. Ross and Co., Negretti and Zambra, R. and J. Beck, and H. Crouch, received awards for microscopes; and Chance and Co. for optical glass. We find no award for permanent photography, or for photo-mechanical printing.

The success of English exhibitors, as indicated by the awards, appears to have been greater than we should have anticipated from the prior criticism, some of which has not been enthusiastic. Mr. W. Bedford's landscapes, for instance, regarded in this land of landscape photography as amongst the most perfect examples of the art, our Philadelphia contemporary mentions as "rather pretty;" Mr. Crawshay's landscapes are pretty; Mr. H. P. Robinson's and many other foreign exhibits disappoint, because they are not new. It is always interesting, however, to see ourselves as others see us; we shall therefore make some brief extracts from our contemporary. Dr. Vogel's views on the subject we have already quoted. Here are the extracts:—

Mr. R. Slingsby, Lincoln, England, has a few choice portraits in large size, shewing excellent work. Mrs. Julia Margaret Cameron, of Lindula, Ceylon, character portraits. The author of these has expressed more of sentiment than of photographic or artistic skill. Mr. Robert Crawshay, Wales, some pretty landscapes; Mr. Frederick York, London, stereoscopic views of scenery, architecture, interiors, zoological, &c.; also 6 by 8 and cabinet sizes, all excellent. Mr. Adolphe Beau, London, examples of the heliotechnic process.

On the wall, Alcove 28, Messrs. H. P. Robinson and Cherrill, Tunbridge Wells, England, portraits, landscapes, and character pictures, mostly produced by combination printing We are disappointed here, as in some other of the foreign exhibits, in seeing nothing new. These have all been exhibited here before, and their merit and novelty to American photographers is an old story. Mr. Frank Good, Hartley, Wintney, England, makes a fine display of his views in Holy Land and Syria. They are in stereoscope and 8 by 10 sizes. Messrs. W. Hanson, Leeds, England, has a frame of neat card and cabinet portraits, and two large heads, finely done; and directly underneath these are the wonderful landscapes by Mr. Payne Jennings, Dublin, Ireland. In these nine 10 by 12 photographs, Mr. Jennings has excelled our most ardent conceptions of what might be produced by pure, simple photography. Here are the most charming compositions, the most enchanting perspective, the tenderest skies, all full of feeling, life, and beauty, and executed on one plate with an effect and perfection that we have seldom if ever seen equalled. The beauty of the work is much enhanced by being mounted with gelatine on plate glass.

Screen 28 has some successful photographs of animals by Mr. David Hedges, Lytham, England, and fine large landscapes by Mr. F. Hudson, Ventor, England. A large collection of card and cabinet portraits, all excellent work, of actresses, operatic, scientific, and literary celebrities, ambassadors and ministers, clerical dignitaries, members of the House of Commons, the Disraeli and Gladstone ministries, and distinguished men, the whole forming an exhibit that is a credit to the London Stereoscopic Company, by whom the work was executed. Messrs. A. and J. Bool have also some large landscapes well done.

The inner wall of Screen 28 has landscapes and interiors, by Mr. M. Davanne; also portraits by Messrs. Hugo Thiele, R. Crawshay, Valentine Blanchard, W. England, and R. Slingsby, some of them being fine in lighting and composition.

The west side of Screen 28 contains a magnificent display of mammoth landscapes by Mr. Vernon Heath. Two of these are about two by three feet in size, and all are as perfectly executed, as far as the movements of foliage and all the finer effects are concerned, as the smallest stereo. We are almost as much puzzled before these pictures, as when confronted by Mr. Kent's portraits; but here we have no intimation of direct negatives, while a friend at our elbow suggests "enlargements," and upon turning to the catalogue we read "Landscape Studies, enlarged and printed in carbon." This settles the question, and we are filled with admiration for the process by which such work can be produced, and feel to thank Mr. Heath for exhibiting these beautiful examples.

Alcove 29, south wall, large portraits and marine views with coloured effects, by Colonel Stuart Wortley; several fine Scotch views without name; Mr. Carl Norman, Tunbridge Wells, landscapes, architectural and interior views, all excellent work.

Mr. W. England, southwest wall, landscapes and sculpture. Mr. William Bedford has quite a large collection of rather pretty landscapes of about 10 by 12 size, mostly of English scenery. In the west window, Mr. F. York, London, exhibits lantern transparencies. Mr. C. P. Lee, Cardiff, coloured enamels; rather pretty, but a little exaggerated in colouring. Mr. A. L. Henderson, vitrified enamels, plain and coloured, quite successful. Fradelle and Marshall, London, cards and 8 by 10, good work. Mr. J. Barnard, Bedford, England, exhibits portraits and architectural views by the chromotype process. Unless this process finds some more successful worker than Mr. Barnard, we fear its permanence will not save it. That same overdone appearance exists in these which characterizes nearly all the work we have seen by this process. Mr. F. Baum, Manchester, England, has a couple of carbon portraits: but he has evidently not attained to the highest success in working the process. This space closes with some Scotch scenes, contributed by Messrs. Wilson, Hood, and Co., to show the working of the Ross new symmetrical lens. On the table in this alcove are several books of architectural photographs, by Messrs. Bedford, Lemere, and Co., London. Mr. G. W. Wilson, Aberdeen, Scotland, a fine collection of his beautiful Scotch scenery, in book form. They are well worth a perusal. Mr. Wilson has also a stereoscope box of transparencies which are very fine, and attract a great deal of attention.

In a subsequent number we find the following:—

Gerat Britain has sent a few fine examples of portraiture, but she has excelled in her landscapes. The productions of G. W. Wilson, Payne Jennings, and Vernon Heath are subjects for profitable study. The latter especially are remarkable as indicating progress in a direction that has scarcely been anticipated. Such beautiful carbon enlargements of landscapes as these open up a wonderful field for the outdoor photographer, who is enabled to operate with small plates in localities difficult of access, and reproduce from these, at home, most excellent pictures of any size his orders or fancy may dictate.

Correspondence.

THE PHOTOGRAPHIC EXHIBITION.

Sir,—Presuming that I am one of the exhibitors alluded to by your correspondent "An Old Member of the Society" as having contravened the rule that "no name or any information will be allowed to remain on the glass or frame" of pictures sent for exhibition, I must ask you to allow me a few words of explanation.

Having to leave home early in May for five months, it was necessary, owing to the early date at which the opening of the exhibition was fixed, to prepare before my departure such pictures as I intended to send, and this I did in the usual manner with names on the mounts.

When I saw the rule referred to, it certainly did not occur to me that it would condemn the common practice of writing the title, &c., on each picture, and I should be surprised to learn that the Exhibition Committee ever intended to proscribe anything beyond the business cards and similar labels which have disfigured the works of several contributors to previous exhibitions.

In any case, I think that the responsibility does not rest with the exhibitors, as it is the province of the committee to reject those pictures which do not comply with the regulations.—I am, sir, yours obediently,

Torquay, Oct. 16th. William Bedford.

[No one, we imagine, would dream of charging a contributor bearing the honoured name of Bedford with wilfully contravening any of the official regulations of the exhibition. The fact that the contributions were prepared months before the regulation in question sufficiently explains Mr. Bedford's position. As he properly remarks, the responsibility rested with the hanging committee, in whose hands the power to reject pictures bearing inscriptions, or to remove such inscriptions, was placed. Indeed, in some cases such inscriptions were, we understand, removed, but not in all, which fact has, unfortunately, given apparently good ground for the charge of favouritism. It must be borne in mind, however, that the hanging committee have a very onerous task to discharge in very little time, hence oversights should be leniently judged. The real cause of dissatisfaction must be traced, we fear, somewhat further back, and will be found in the edict forbidding inscriptions. Large disfiguring labels and shoppy announcements are an undoubted eyesore; but a neat label announcing the exhibitor's name, the title of the picture, a motto, or even interesting information regarding the picture, would add much to the interest of the exhibition, as nothing disturbs the attention so much in examining pictures at an exhibition like the present as the constant necessity for consulting the catalogue. We can scarcely imagine that the motive for such a rigid regulation was to compel visitors to purchase catalogues, as some have charged, but it is evident a blunder has been committed, which will doubtless be avoided in future.—Ed.]

Sir,—Will you kindly allow me a little space, in order that I may make an appeal to the exhibitors and members of the Photographic Society?

I have read all the recent correspondence criticising the Exhibition, and I cannot but feel sorry that it is receiving, in some quarters, such wholesale condemnation. For my own part, I think that, from my knowledge of former exhibitions, there is very much to be admired in the present one; and were I to enumerate the names of those exhibitors who deserve praise, I should be trespassing too much upon your columns; yet, at the same time, I cannot refrain from specifying the contributions of Mr. Crawshay as being so full of beauty, that they alone would repay any one for a visit to the Exhibition. These twenty-five pictures resemble sepia-painting, only they are infinitely more beautiful. They have been hung almost all upon the line, and in close proximity to the cold-toned exquisite productions of William Bedford, forming a most pleasing contrast.

Complaints have been made respecting the hanging in general, but where there is such an *embarras de richesses*, what are the committee to do? They would like, doubtless, to put everything upon the line, but as that is an impossibility, they have done their best. If those who have found fault knew how arduous and fatiguing was the work of a hanging-committee, they certainly would be inclined to assist those who kindly undertake it, instead of disheartening them by ungracious criticism.

Allow me to add a few words respecting the early date of the exhibition. If, as we understand, it is a case of "Hobson's choice," and the gallery is only at liberty during this time, and the Council and Treasurer, with an eye to the finances, consider that it will bring more "grist to the mill" to open the exhibition for the whole of the period, than to shut it up for a part of the time, and pay rent for empty rooms; then surely, when these considerations are borne in mind, the members should be satisfied, and do what they can to ensure its success.

The date was settled at the end of last season, and three months should be sufficient for exhibits to be got ready; besides, photographers must do other good work, in addition to that they especially prepare for the exhibition. Some have contrived to be ready, therefore others might have done the same. Let each who finds fault with the small number of exhibitors remind himself that his would have added another name to the list. I believe that the "putting off to the morrow what might have been done to-day" is the real secret of their standing aloof. "Procrastination is the thief of time."

Let me earnestly appeal to all to endeavour to promote, and not retard, the success of the exhibition, and, as members of the society, do what they can to further its prosperity.

When next season comes round, they must, one and all, try to be very good boys indeed, if only to please your correspondent, A Lady.

London, Oct. 17th.

RECKLESS ASSERTIONS.

Sir,—In your last number Mr. Williamson accuses me of reckless assertions.

First, I had stated that he was in Edinburgh after the 21st July. He replies that he left for the country on the 13th July. My authority was a well-known gentleman who told me he had conversed with Mr. Williamson in Edinburgh at the date I mentioned. Of course I must believe that my informant was mistaken as to the date of the conversation. I enclose his name.

Second, Mr. Bashford sent you some time ago a communication about Mr. Williamson—I stated "it might be presumed by authority," never dreaming that any one would do such a thing without being duly authorised. Mr. Williamson thus settles the matter: "It is wholly untrue that Mr. Bashford, who has written to me on the subject, had any authority whatever for his communication."

His letter concludes with the usual display of refined taste and chaste rhetoric—

> "A tale with little meaning, though the words are strong."

I regret having to trouble you with these personal matters.—I remain yours, &c., W. Neilson.

Edinburgh, Oct. 16th.

BRONZE PRINTING AND YELLOW SPOTS.

Dear Sir,—Some of your correspondents appear to be sceptical on the subject of the connection between gold printing and yellow spots on photographs. Two old cartes that I found a few days ago, I enclose; they tell their own tale. The third enclosure is not printed in gold, but in all probability may have come from an establishment where gold lettering was conducted, and the almost impalpable gold bronze would be sure to pervade everything. I do not say that gold lettering is the only source of yellow spots, but that it is a very prolific one.—I remain, dear sir, yours truly, T. H. W.

Leominster, Oct. 17th.

[All the examples enclosed are good illustrations of the effect of the bronze printing. One is especially striking; the print has been mounted over a name and border printed in bronze, and this name and border are now distinctly reproduced in yellow on the face of the print.—Ed.]

Proceedings of Societies.

South London Photographic Society.

The first of the usual series of monthly meetings for the winter session was held in the Hall of the Society of Arts on the 13th inst., the President, Rev. F. F. Statham, M.A., in the chair.

After the minutes of the previous meeting had been read, and private business relating to the library had been transacted,

The Chairman intimated that the Technical Exhibition would be held on the 9th of November, and the Annual Dinner on the 11th November.

Mr. Warnerke then read a paper "On Some New Applications of Sensitive Negative Tissue" (see page 493).

The Chairman thought that they would all agree that Mr. Warnerke had given them several quite new applications of his negative tissue. He had shown the superiority of tissue over glass for several purposes, for the avoiding of halation, the production of combination negatives, and the improvement of stereoscopic pictures.

Mr. Hughes, after referring to Tyndall's doctrine of the visibility of light made manifest by the atoms upon which it shone, thought that it was a straining of this theory to apply it to the fogging of collodion plates in the way Mr. Warnerke had done In the body of a transparent plate of glass there were not, he considered, any such particles as would cause the light to turn upon itself and affect the film through which it had just passed. In proof that the uses of collodion films had long been known to photographers, he adduced the practice of Mr. Archer, who at one time invariably removed all his films from the glass plate. Mr. Johnston, of Wick, too, had long, ago introduced a method of forming combination negatives by superposing one film upon another, and some fine composition pictures exhibited several year ago by Mr. Diston had been produced in that manner.

Mr. Taylor reminded the chairman that what he (the chairman) had hinted was a feature of novelty in the printing and mounting of stereoscopic pictures—viz., the causing of the picture to appear as if projected far beyond the mount—had long been recognized as a necessity in mounting stereoscopic pictures in the best manner. He also spoke of the advantages that would result if pictures were taken on dark-coloured glass, and the film then transferred to plain glass, a topic, he said, that had been formerly brought under the notice of the Society as an effectual means of preventing halation.

Mr. William Brooks did not quite approve of Mr. Warnerke's method, by adding clouds to his negatives, as he thought it would make the sky look too heavy. He always printed in his clouds by a second printing.

Mr. York, too, adopted the method first mentioned.

Cloud negative should be very thin and delicate.

After Mr. Warnerke had replied to the objections of the various speakers, a vote of thanks was unanimously awarded to this gentleman; and after the exhibition by Mr. Taylor of several specimens of M. Leon Vidal's photo-polychromes, the meeting separated.

Talk in the Studio

The Boudoir Portrait.—This style of portrait has scarcely acquired so much vogue as it ought. There are, however, some good examples in the Exhibition. We learn that it is receiving attention also in the United States. Mr. Rulofson, of San Francisco, has adopted it in preference to the "promenade," as being alike suitable for large busts and full-length figures, whilst the promenade is only suitable for full-lengths, and that of ladies.

A Year in Developing.—The Editor of *Anthony's Bulletin* gives a curious instance of protracted development. He says:—"Mr. Roche, having had occasion to make some negatives of furniture, under-exposed one so much that he decided not to attempt to redevelop it. It was developed on the spot with iron and a wash of water and glycerine, applied for the purpose of keeping the plate moist, so as to be finished in the dark room. This plate was put away in the dark in a plate box in this moist state, and was lost sight of for a year or more. Upon being brought to light, it was found that the developer had continued its action, and the result was an excellent negative."

Novel Photographic Album.—If the public are on the one hand anxious for novelties, inventors and manufacturers are on the other no less anxious to gratify them. The very latest is a new description of ring for dinner napkins, introduced by Messrs. Pyke, of Ely-place, the peculiarity of which is that besides fulfilling its legitimate office, it also serves as a kind of photographic album. Incongruous as this may appear, it is nevertheless true. The rings are electro, and for about a fourth of the circumference are double, the outer portion having an oval opening. The narrow space left between the two is just sufficiently wide to admit a photograph—say, the head and shoulders of the ordinary carte size—the oval opening of course forming the frame of the photograph. The rings are sent out fitted with the portrait of some celebrity, but there is no reason why a whole family should not have photographs of themselves inserted, and have the gratification of staring at their own "counterfeit presentments" while they eat their dinners. Truly, this is an age of progress.—*South London Press.*

An Unequal War.—The *Photographic Times* has the following:—"The Rev. Phillips Brooks, of Boston, if we may credit the local journals, is waging unequal war with a photographer. It appears that he is as averse as St. Simon's friend, La Trappe, to having his portrait taken, and that a subtle photographer, learning this fact, lay in wait for him, got a good "negative," and advertised his work. All the young ladies of the Hub, of course, swarmed to the photographer's shop, which, coming to the ears of the Rev. Mr. Brooks, so exasperated him that he went straightway to the same place, bought up all the photographs of himself then on hand, and destroyed them. The next day a new supply appeared, which again he bought up, and so the fray goes on, to the infinite joy of the artist. Of such a contest there can be but one end, no matter how large the salary may be of Boston's favourite divine, unless he will adopt our advice, and change his countenance. If he wears his whiskers, now let him shave; if he shaves, let him grow his whiskres."

Elastic Dammar Varnish for Photographs, etc.—An elastic flexible varnish for paper, which may be applied without previously sizing the article, may be prepared as follows:—Crush transparent and clear pieces of dammar into small grains; introduce a convenient quantity—say forty grains—into a flask, pour on it about six ounces of acetone, and expose the whole to a moderate temperature for about two weeks, frequently shaking. At the end of this time pour off the clear saturated solution of dammar in acetone, and add to every four parts of varnish three parts of rather dense collodion; the two solutions are mixed by agitation, the resulting liquid allowed to settle, and preserved in well-closed phials. This varnish is applied by means of a soft beaver hair pencil, in vertical lines. At the first application it will appear as if the surface of the paper were covered with a thin white skin. As soon, however, as the varnish has become dry, it presents a clear shining surface. It should be applied in two or three layers. This varnish retains its gloss under all conditions of weather, and remains elastic; the latter quality adapts it especially to topographical crayon drawings and maps, as well as to photographs.—*Pharmazeutisches Centralblatt.*

Blisters.—We find the following in *Anthony's Bulletin*:—"A bath of alum (consisting of one part of pulverised alum to sixty parts of common water), to be used immediately after the toning bath, and letting the sheets soak five to ten minutes. Afterwards one proceeds in the accustomed way to fixing. In using this remedy, care should be taken that the acidity of the alum should be corrected before the immersion of the prints in the hypo bath. It is possible that the alkaline condition of the prints upon emerging from the toning bath may be sufficient to neutralize entirely the acid reaction of the alum. This can easily be tested."

Unregistered Sale of Poisons.—There appears to be some considerable difference of opinion as to the extent of the obligation of chymists to register sale of poisons. Recent circumstances have emphasized strongly the desirability of a very rigid interpretation and observance by chymists of the provisions of the law which require them to carry out such registration, and to observe the conditions of the clause of the Pharmacy Act which require them not to sell poisons to any stranger unless after an introduction by some person known to the vendor. At an inquest at Spalding lately it transpired that three ounces of laudanum had been sold in one day to a stranger without introduction and without entry on the register. This, it appears, is indeed the general custom of the trade; the Coroner declared it to be contrary to the law; and other good legal opinion has since confirmed the view; but the official *Pharmaceutical Journal* states that the practice of the chymist in this instance is that of the trade generally, and has been so for many years; and it hopes that "local officials will be restrained from commencing vexatious proceedings against unoffending chymists and druggists." In that hope it is hardly in the public interest that others should concur.—*British Medical Journal.*

Light and Life.—A discussion recently took place in the French Academy as to the influence of solar radiation and of green matter in the formation of the immediate principles of organized beings. M. Boussingault was disposed to think that this influence is indispensable—that if solar radiation disappeared, life would become impossible. M. Pasteur, on the other hand, considers that, in the case supposed, life might continue in certain inferior plants, and produce the most complete organic matters. He cited as an example the life of Mycoderma aceti (flowers of vinegar), which may occur in the absence of light, in a medium composed of alcohol, acetic acid, and mineral phosphates, among which is that of ammonia. M. Boussingault replied to M. Pasteur that the alcohol and acetic acid had for their origin the sugar, which (according to him) could only have been formed with the aid of solar radiation and of green matter—that consequently the case of growth cited came within the general theory. M. Pasteur observed that it was not so; for, by the methods of synthesis known, chemistry may now, starting with carbon and vapour of water and by laboratory reactions, form alcohol, acetic acid, and a host of other products fitted to serve as carbonized aliments for inferior organisms excluded from light.

Cements.—A new cement for uniting metallic to non-metallic substances is composed of thin-made glue, mixed to the consistence of thick varnish with wood ashes. The ashes should be added gradually to the glue during ebullition, with constant stirring, and the cement should be used hot. A strong mucilage, capable of fastening wood or porcelain and glass together, is made of 8½ ounces of strong gum-arabic solution, to which a solution of 30 grains sulphate of aluminum dissolved in ⅔ ounce of water is added.—*Scientific American.*

To Correspondents.

Gib.—We cannot answer with certainty as to how far good positives may be taken on Kennett's gelatine dry plates; but we should be disposed to think it quite possible. The most important difference, remember, between the production of negatives and the production of positives consists in the mode of development. Take care not to push it too far. A shorter exposure is necessary than for positives, and a still shorter development.

Learner.—A good portrait lens will be most suitable for the purpose. 2. The lens you name would do well for the purpose. 3 and 4. We cannot enter into any question of price in this column. 5. We fear that you will not find any one disposed to accept a very small price for a very good article; but if you use judgment you may, of a second-hand dealer, frequently get a good article at a reasonable price. As a rule, you may with safety buy a lens by a good maker of a second-hand dealer.

M. Noon.—We should be disposed to give the preference to No. 2 in your list.

A. de Suley.—The method of enamelling photographs in general use is the same in principle in all cases, but there are modifications in the mode of applying it. We have published details of several methods. Perhaps the completest method and the fullest description will be found in Mons. Piquepe's little Manual, recently published by Messrs. Piper and Carter.

P. Mitchell.—The formula originally published for the use of acetate of morphia in the iron developer has generally been found to answer best. It stands as follows:—Dissolve 4 grains of acetate of morphia in an ounce of water, and add 2 drachms of glacial acetic acid. Add one drachm of this to an ounce of a 30-grain solution of photo-sulphate of iron. It is better that the morphia should be added to the iron solution on the same day that it is used.

G. H. S.—The platinum process is patented, and cannot be used without the permission of the patentee or his representatives. Your best plan will be to make application to the Albion Albumenizing Company, who are agents for Mr. Willis, and learn from them on what conditions you can, as an amateur, experiment with the process. They will also, we believe, supply you with the proper materials.

B. F.—If distilled water be not readily accessible, hard water, which has been boiled for a time to precipitate the carbonate of lime, may be used for photographic purposes. Rain water may also be used, especially for the developer, but we should prefer trusting to the boiled hard water in making a nitrate bath, as rain water is frequently contaminated with organic matter.

R. D.—As a rule, all spirit varnishes require to be applied with heat. All varnishes in which benzine or chloroform is the solvent may be applied cold. For negatives spirit varnishes are best.

Copyist.—You will find in several of our Year-Books details of all the various modes of intensifying which have been proposed. The following is the method for which you ask, for producing scarlet negatives, as given by Mr. Lea:—The negative is first treated with a solution prepared as follows: saturated solution of bichloride of mercury, diluted with ten times its bulk of water; apply this to the negative until the light stage is reached, and then, after washing, a dilute solution of Schlippe's salt (sulphantimonite of sodium) is poured over it. The negative instantly turns bright scarlet. The solution of Schlippe's salt should contain about ten grains to the ounce, and should be kept tightly corked. The method of producing chocolate coloured negatives by Selles' method is different. A clean negative, not over-exposed, is best. To this apply the solutions made as follows:—Ferridcyanide (red prussiate of potash), ten grains; persulphate of uranium, ten grains; dissolve each of these salts separately in ten ounces of water, and mix as required. Wash well between application of each solution. In some cases, we have heard that the deposit is apt to scale off the image; but we have not met with such a case.

F. D. M.—In making a solution of wax in ether, to apply to a glass plate for aiding transfer of the film, it is not important to use any especial proportions. Place in a wide-mouthed bottle the wax, broken into small pieces, and sufficient ether to make it into a soft paste.

J. G.—Prints are not thoroughly washed by remaining many hours in running water. We prefer some mechanical aid to the removal of hypo, as well as change of water. Sponging each print is a good plan. Collecting the whole, after several changes of water, and submitting them to heavy pressure, so as to remove all the water from them, and then washing well again, is a good plan. But the hypo clings too persistently to be readily removed by the mere action of running water.

M. G.—It is almost impossible to avoid halation, if the plate requires long exposure, and there is a window immediately opposite the lens. A very creamy film will aid you. Or use a plate of orange glass, and then remove the film for printing. This will prove a cure.

J. H. W.—Many thanks for prints duly arrived. They are all exceedingly good; but we prefer the smallest of the three, which is exceedingly perfect. The transparent effect of the moving water, showing every little eddy produced by the stream coming in contact with the jutting projections of the shore, is exceedingly satisfactory.

G. M. T.—Your letter on "Spirit Painting and Spirit Photography" was placed aside, and accidentally overlooked last week. It is not desirable to open any controversy in our pages on the subject. Your comment on the "spirit painting" should have been sent to the journal where the details appeared. Spirit photography has been thoroughly discussed in our pages, and as we have before said, we have been able to detect the imposture in most of the examples brought under our attention. We do not undertake to define the limits of the possible, and they who do so are exceedingly arrogant. A century ago, the mass of mankind would have said that the electric telegraph was impossible; but we may add, in relation to the subject upon which you ask our opinion, that we have never met with any evidence tending to show the truth of modern spiritualism.

Young James.—Fuming is, in our view, in most cases an advantage; the prints tone more quickly, and assume a richer tone. The paper generally prints a little quicker also. We have very often described the method of fuming, and can only briefly indicate here the mode of proceeding. Take a good sized box—any kind of packing case will serve—line it with paper to make it air-tight, and see that the lid fits well. Now place a saucer at the bottom with (say) an ounce of liquid ammonia at the bottom. Pin a sheet of sensitive paper with its back to the lid, close the box, and allow the surface of the paper to receive the fumes of the ammonia for ten or fifteen minutes. It is then ready for the printing frame. The paper should be quite dry before placing in the box.

Several correspondents in our next.

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METEOROLOGICAL REPORT FOR SEPTEMBER.

BY WILLIAM HENRY WATSON, F.C.S., F.M.S.

Observations taken at Braystones, near Whitehaven,
36 *feet above sea-level.*

N.B.—Barometric observations not reduced to sea-level. Temperature in the shade.

Date.	Barometric Pressure.			Temperature			Remarks.
	Morning	Noon.	Night.	Morning	Noon.	Night.	
1	29·30	29·39	29·47	54°	62°	54°	Fair and bright
2	29·50	29·60	29·60	52	58	52·5	Rain this morning and afternoon
3	29·61	29·70	29·58	52	59	53	Fair, but gloomy
4	29·40	29·43	29·18	56	63	55	Rain a.m. and p.m.
5	29·18	29·24	29·28	57	59	54	Rain a.m. and p.m.
6	29·18	29·25	29·26	52	60	53	Fair and sunny
7	29·25	29·25	29·27	50	58	54	Rain this morning
8	29·30	29·42	29·43	51	60	52	Showers a.m. and p.m.
9	29·38	29·50	29·50	63	61	54	Fair, generally gloomy
10	29·36	29·50	29·50	54	62	54	Rain p.m.
11	29·47	29·50	29·52	52	58	53	Fair, but gloomy
12	29·54	29·58	29·53	51	56	50	Fair and sunny
13	29·50	29·52	29·54	50	58	52	Showers morning and afternoon
14	29·50	29·50	29·57	51	58	51	Fair and sunny
15	29·50	—	29·53	55	—	50	Fair and sunny
16	29·40	—	29·40	48	—	52	Fair, but gloomy
17	29·34	—	29·40	52	—	53·5	Rain a.m.
18	29·48	29·51	29·72	56	57	48	Rain this evening
19	29·87	29·97	30·00	53	60	54	Fair and sunny
20	30·00	30·10	30·00	54	64	52	Fair and sunny
21	29·94	29·90	29·83	53	65	51	Fair, generally gloomy
22	29·76	29·70	29·65	54	68	50	Fair and sunny
23	29·54	29·56	29·50	58	60	55	Rain a.m. & p.m. Thunderstorm p.m.
24	29·47	29·30	29·31	57	60	56	Rain morning and afternoon
25	29·39	—	29·48	54	58	55	Showers with wind p.m.
26	29·44	—	29·41	57	57	57	Fair, but gloomy
27	29·40	29·40	29·40	51	56	54	Fair and bright
28	29·25	29·19	29·22	55	59	52	Showers morning and afternoon
29	29·27	29·32	29·37	49	52	51	Fair and sunny
30	29·41	29·36	29·30	50	52	48	Rain p.m.

Summary.	Mornings.	Noons.	Nights.
Highest temperature observed	58°	68°	57°
Lowest ditto	48	52	48
Mean ditto	53·1+	61·5	49·9

Mean of all observations ... ... 54·8
Number of fair days 16
Number of days on which rain fell 14
Number of fair days sunny 10
Number of fair days gloomy 6

Notes.—On the 24th a very severe thunderstorm, with heavy rain, passed over here, commencing about four o'clock in the afternoon and continuing till about seven in the evening. The storm was undoubtedly the most severe which has been noticed here for many years. The sea being near on one side and the mountains on the other, thunderstorm seems often to take to either the one or the other side; but not so in this case. Considerable damage was done by the lightning, which was both vivid and frequent, to farm buildings, cattle, &c. Although the rainfall during the month was 4·39 inches according to Mr. J. D. Watson's register, the evaporation amounted to 3·21 inches. We are now having sharp cold mornings and evenings, with heavy dews.

Braystones, near Whitehaven, October 4, 1876.

The Photographic News, October 27, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

An Out-Door Apparatus for Wet or Dry Plates—Vandalism in Pall Mall.

An Out-Door Apparatus for Wet or Dry Plates.—Many attempts have lately been made to facilitate camera work away from home, and there is not one among us who is not familiar with some sort of changing box, or wet or dry plate arrangement whereby exposures may be made without carrying about the country a dark tent and whole laboratory full of chemicals. Certainly, the greatest step of progress made in this direction—of late years—is the roller dark slide of Mr. Warnerke, who has been successful in doing with the collodion method what Fox Talbot, many years ago, accomplished with his paper process. The easy and simple way in which the flexible sensitive paper could be employed in the Talbotype process led many old photographers to stick to this material long after Archer brought forward his collodion plates, and the photographer's portfolio for negative paper is not altogether forgotten, even now. Mr. Warnerke's sensitive film brings back with it all the advantages which appertained to paper negatives, and certainly places in our hands one excellent method of solving out-door photography. Another plan, lately brought forward by M. Jonte, of Paris, also deserves commendation, and must not be passed over in silence. M. Jonte—whose name as a clever apparatus maker is as familiar almost in London as in Paris—has essayed to solve the difficulty from a mechanical point of view, and it seems to us that he has succeeded, if not altogether, at any rate in a very high degree. M. Jonte sends one of his apparatus to the Exhibition at Pall Mall, and we have the testimony of one noted amateur, M. de Rothschild, of Paris, that it may be employed just as well for wet as for dry plates. If this is truly the case, the ingenious apparatus of M. Jonte will receive more than ordinary attention, for there are many photographers who will not hear of dry plates, and who have made up their minds that they will never use other than wet films in their work. This apparatus, then, of M. Jonte will, we are told, preserve wet plates in a moist condition for something like eight hours, or, in other words, practically throughout the ordinary length of a working day. The films are so enclosed on all sides that the moisture cannot well escape, and it is only during the few seconds of their exposure that they come out of their damp box, and are then, of course, only subject to the drying influence of as much air as may be contained in the bellows camera. The box is made to carry twelve plates, and these fit each into a separate frame, so that every one has something the appearance of a transparent drawing-slate, except that there is a black backing to prevent reflection as much as possible. These frames are placed in the plate-box, and may be raised at any time by means of notches made at each side of them; a pair of hooks descend and raise any frame the operator may desire, the latter having merely to see that the lifting arrangement is set properly over a particular plate in order to lift it. But we had better describe the general nature of the apparatus before we go any further. Shut up for travelling, it is a tall oblong cabinet, that is set upon a tripod of suitable height. The lower portion of the cabinet is the plate box; the upper the camera. There is nothing particular in the latter to call for attention. It is a bellows camera of extraordinary long focus, and as the back cannot be moved for focussing—for it must always be set exactly over the spot corresponding to the plate below—it is the front that must be worked to and fro in order to get the image sharp. If No. 1 plate is to be exposed, the back of the camera is pulled back as far as it will go, so as to be over the first film; or if it is the turn of No. 5 to be exposed, then the back is moved just five divisions forward. There is nothing else to do beyond this simple placing of the back of the camera in its proper division over the plate to be exposed. The back being thus fixed, you proceed to focus by moving the front to and fro. Having done so to your satisfaction, you press a spring, which puts the ground glass out of position, and then all that remains is simply to work a screw, which picks up a plate from below, and puts it into the position formerly occupied by the ground glass. You expose, and then lower the plate back again into its box. Thus there is nothing at all complicated in the affair. You have exposed No. 5, and now you want No. 6 plate. You simply move the back of the camera one division foward, so that it is over No. 6, and then proceed as before. One other little point remains, however, to be mentioned. It is a little tell-tale, to tell you what plates have been exposed in case you have miscalculated or have forgotten. On the top of the camera are a series of ten holes, and a slip of paper is pushed into a slot and made to cover these orifices. When No. 1 frame, however, is raised from below, a pin attached to the top of the frame projects through the top of the camera, and perforates the paper; when, therefore, the operator finds that ten perforations have been made, he may be sure that all ten plates have been exposed, or can find out at once, if one film is still unimpressed, what its number is. As we have said, M. Jonte has more especially constructed the apparatus for dry plates; but so well enclosed are the films that it may be used for wet ones as well, when a photographer has a reasonable hope of getting through his work in half a dozen hours or so.

Vandalism in Pall Mall.—We have not as yet ventured to say anything in this column touching the Exhibition at Pall Mall, for the simple reason that it is a subject hardly within ourp rovince; but we have a suggestion that we can scarcely refrain from making, and it is, that there should be from time to time an attendant in the room to look after the property of exhibitors. We have heard already of several articles being stolen—we can apply no other word—and of one piece of apparatus at least being wantonly injured. A roller dark slide which we inspected the other day was completely wrecked; its hinges had been strained backwards, a leather tongue violently pulled out, at once admitting light through a half-inch orifice, and a brass hasp had been deliberately wrenched from its place. Altogether, the ingenious and delicate little bit of mechanism had been most shamfully treated. Who it is that can have been guilty of such acts of Vandalism goodness only knows; but that they have been committed is simply a fact. Two articles shown for exhibition have straightway disappeared without a trace being left behind, and although they may be isolated instances, the matter is far too serious to be passed over. Exhibitors have a right to expect that ordinary measures are taken to protect their property, and this would hardly seem to be the case. If no other course can be suggested, a second attendant or commisionaire should be hired to look after the room.

OUTWARD INDICATIONS OF CHARACTER.*

There has survived to us from Elizabeth's days a quaint old book with a still more quaint old title. 'Tis called "A Knack to Know a Knave," and as that is a valuable "knack," no doubt the book was popular among the generation to which it was addressed. I refer to it now only because its title bears on a branch of study which has always engaged the attention of the curious—namely, that of means whereby to judge of character. In our intercourse with the world it is most desirable to be able to form a true estimate of those we meet. When a person is introduced to us, our first mental inquiry is—"Is he an honest man? What sort of character does he bear?" And we feel that it would be most valuable to have a "knack" of finding this out—a test which we could apply at once, on the spot, with unerring results.

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* "Rupert," in *South London Press.*

To an extent, nature has given us such a test in our instincts. We are seldom wrong in those we "take to" at first, and generally live to repent it if we force ourselves to "get over" the first sense of aversion. The Laureate has a capital passage on this subject in one of his minor poems. A poor clerk has been robbed of his savings by a smooth-tongued hypocrite, and says to his wife:

> Ah, love, there surely lives in man and beast
> Something divine to warn them of their foes.

He explains how, when first he met the man, something said, "Trust him not;" but after, when he came to know him more, he lost this, and in reality knew him less, and in the end trusted him—to his own ruin. But inasmuch as this instinct is not an unerring guide, attempts have been made in all ages to discover other tests of character which might be applied with infallible results. Some of these are very curious. One of the most familiar is judgment by the hand. There is great character in hands, and a minute study of them would really enable a person to form shrewd guesses of the sort of persons they meet from the hands they offer in a friendly grasp. But then you cannot take a stranger's hand and examine it as if it were a fish you wanted to buy, but were not sure as to its being quite fresh. Other tests have, therefore, to be sought; and there are many who rely greatly on the eyes as an index, while others are equally confident in the unerring testimony of the mouth. The eyes are certainly most expressive: it is almost impossible to find a "knave" with a clear, frank eye, that never blenches nor hesitates to meet your own with prompt alacrity. Eyes that never meet yours are the eyes of the shuffler, and the man not to be trusted. On the other hand, the mouth is a sad tell-tale organ. It is very, very little under control. There are people whose faces are masks, which they hide behind. The features enter into a conspiracy to deceive the onlooker. But the mouth is never a party to the compact. It is not to be wheedled or coerced into anything but itself. Watch persons under trying circumstances, and they may have such control over their features that, as the Bible says, they "set their faces like a flint;" but there is ever a twitch of the lips which betrays the hidden emotion.

Giving to eyes and mouth their due place, philosophers have seized on the nose as a good, prominent feature by which to judge of character, and a perfectly elaborated system of Nasology has been published. From this we gather the following hints. The Roman nose indicates energy and firmness, with an absence of refinement; the Greek, refinement, astuteness, and craft; the cogitative, or wide-nostrilled nose, strong mental powers, and the habit of exercising them; the Jewish, shrewdness and insight into character; the snub, weakness, and a tendency to meanness and petty insolence. These are the main varieties of noses; but there are many sub-divisions, and the student who ventures on Nasology as a subject will find ample field for observation, and, I am bound to say, will acquire many valuable hints to be turned to account in the battle of life. It is worthy of passing note that no less distinguished a man than Napoleon Bonaparte had a profound belief in the nose as an indication of character, and the Fates played him a sad trick in connection with this belief. "Give me a man with plenty of nose," he was wont to say—and they gave him Wellington!

Claims have been put in for the teeth as being most expressive of the man, as indeed they often are. I have always avoided people whose teeth have an inward tendency—there is generally something sharkish about them. Then, again, there are ear-philosophers. The ear is admitted to be one of the best tests of age, and it is asserted to be also most valuable as indicating the nature of individuals. The hair, the nails, the gait—in fact, almost every feature and peculiarity, have been laid hold of, and pressed into the service of those bent on reading character. Thus each of us, while hugging a belief in our secretiveness and power of holding our own against the world, is absolutely transparent to those around who have the wit to mark the indicia which Nature has supplied, and to interpret them aright. And now I am about to add to the number of indications of character one which I have never seen dwelt upon, but which is, to me, full of significance. I allude to the angle at which the head is carried. This varies most remarkably in different individuals, and always tells its tale. You will see one man throw back his head until his nose forms a horizontal line. Would that man be humble in mind, doubtful of his own merits, or in anywise inclined to underrate himself? Not he. Then there is the man of whom it has been cleverly said:—"He walks along the street with his chin high up in the air, his nostrils sniffing the clouds, with the calm conviction imprinted on his face that all the passers-by are erecting altars to him in their hearts. The head carried quite erect, with the eyes looking straight forward into the eyes of the world, is a good sign, but it indicates energy and the capacity to cope with and overcome rather than any special intellectual force. The head of the man with great brain power inclines forward; the heavy ear of corn nods earthward with its weight. Conceit carries its head, as it often carries its hat, a little sideways. Stupidity thrusts forward the neck. These are only a few hasty notes, for I have not yet formulated my theory of character as indicated by the angle at which the head is set on the shoulders; but there is in it, depend on it, the basis of a science. The French greeting, in place of our "How are you?" is "How do you carry yourself?" ("*Comment vous portez vous?*"); and from a philosophical point of view, this is of the utmost moment—as we carry ourselves so we *are*.

Shakespeare puts it as one of the highest accomplishments of the Sybil that she "could almost read the thoughts of men." A useful accomplishment; but it is even more to be able to know how men will think, and to what purpose—whether straightforwardly to good ends, or crookedly with sinister motives; to read their hearts, in fact, and by a knowledge of what they are, to divine what they will do as surely as the owner of a mould knows what pattern that mould will turn out. This is not easy reading; but it may be mastered, and it is well that the man of the world should neglect none of the arts which will help him to expertness in divining character.

CLEANING, MOUNTING, VARNISHING, AND FRAMING PICTURES.

Photographers, as a rule, are handy and ingenious Jack-of-all-trades, and master of many may fairly be applied to a very large proportion of them: witness the multitude of ingenious contrivances to facilitate good work which have been produced, not by professional mechanicians, but spring from the fecund brain of the experimental photographer. Some time ago we noticed a little volume entitled "The Practical Carver and Gilder's Guide, and Picture-Frame Maker's Companion," published by Mr. C. H. Savory, of Cirencester, and we promised that at some time we should make some extracts for the benefit of readers, a promise which we now propose to redeem. We should say at the outset that in doing this our extracts cannot form any substitute for the volume, which is just the book which will prove interesting and useful to the ingenious section of our readers who are interested in trying their hands at all the manipulative operations in connection with pictures. It contains instructions for every operation in connection with making frames, framing pictures, cleaning, restoring, mounting, framing, making mounts, besides a large number of recipes connected with the various operations.

Regarding the cleaning of oil paintings, which, judging from frequent enquiries from correspondents, is an operation which photographers are anxious occasionally to attempt, we do not think it prudent to give instructions here. The operation is a very delicate one, and should only be attempted by an expert. A sponge and tepid water may be applied without risk to remove the deposit from smoke, dust, &c., or a slice of raw potato may be efficient for the same purpose. If the experimentalist have had a little experience with such matters he may without difficulty remove a coating of mastic varnish by gentle friction with the finger ends. But efficient cleansing and restoration should only be attempted by an expert. The little volume in question enters, however, fully into the subject, and gives some valuable hints. We frequently receive enquiries as to the best mode of dealing with old discoloured engravings, photographic copies of which may be required. Here is a recipe which give the information.

" *Cleaning Engravings.*—The engraving must be laid down on a smooth board, with a clean sheet of paper underneath, and with a clean sponge and water carefully wet the picture on both sides, and then saturate it well with a soft sponge with the following mixture :—

Chloride of lime	¼ pound
Oxalic acid	2 ounces
Water	1 quart

The above will be known to be of the right strength by its turning a magenta colour. The application must continue as long as there is any stain to come out, and then sponge freely both sides with clean water. We have cleaned engravings so stained and yellow that the picture could scarcely be distinguished. The paper looked as clean as when it was made, and the engraving stood out brilliant on its new background.

" We must caution those who try this receipt not on any account to use it on water-colour drawings or prints that have been coloured with water-colour, as in the first instance a clean sheet of paper would be the result, and the coloured print would be left plain. This receipt will not touch any colour that has been mixed with oil, as is the case with the ink the picture is printed with. The above receipt loses its virtue when it has been made some time."

Although the process of cleaning or restoring an oil painting involves risk, it is not difficult, with a little skill and judgment, to varnish a painting safely. Here are some hints :—

" *Varnishing Paintings.*—Some artists employ for new paintings white of egg as varnish ; others do not varnish their paintings for one or two years after being finished, when the colours are completely hardened and mellow. Mastic varnish is the only one which can be removed at pleasure, and for that reason is generally preferred to all others, although it is very liable to chill—that is, it becomes all over of a bluish steamy hue, which obscures the beauty of the painting, and appears disagreeable to the eye. Many circumstances contribute towards causing it to chill: for instance, varnish made from weak, unripe gum mastic and common spirits of turpentine will chill, particularly if applied on new paintings, where the grounds, oils, and colours are fresh, soft, and absorbent. In order to prevent this, if possible, employ no varnish but that made from fine ripe gum mastic and rectified turpentine. Varnish for oil paintings, after being properly made, ought to stand for at least twelve months in large wide-mouthed glass bottles, without a cork, covering the mouth with a piece of glass, so as to admit the air, but prevent dust falling in ; place the bottle so as to receive a full light, but no sun. The light and air so change and modify the essential quality of the turpentine, that the varnish becomes elastic, clear, and brilliant, having so much improved during that time as seldom or never to chill or become steamy, and by age it loses that attraction which all new-made varnishes possess for moisture and impure exhalations. Therefore, as a preventive against varnish chilling, employ none but good old varnish ; never apply it on new or old paintings until properly cleaned, and well dried from moisture ; apply the varnish in a warm room, where the painting and varnish also receive a proper warmth ; after the varnish is applied, let it remain until properly dry, recollecting that with all new-painted pictures, where the grounds and colours are soft and absorbent, and where the pictures are afterwards exposed to strong moist exhalations, the varnishing in time will chill ; but when paintings are properly cleaned and varnished, and afterwards hung up in dry rooms or galleries, there is no reason to fear their chilling."

An efficient method of preserving a painting which has begun to crack or scale will often be found valuable. Here is one given ; but we should recommend that it be tried on a picture of little value first.

" *To Preserve a Scaling or Cracked Picture.*—The preparation is a mixture of equal parts of linseed oil and methylated chloroform, which is to be poured over the painting if the colours are too brittle to bear the friction of a soft brush. After remaining on the surface of the painting for a day or two, the excess of oil may be removed by means of a piece of cotton wool or a soft brush, a fresh portion of the preservative applied, and the excess removed as before. The process must be repeated from time to time until the colours are firmly fixed, when the painting will bear friction, and may be submitted to the cleaning process, or varnished. It is advisable, however, to remove as much of the dirt as possible from the picture by careful washing with soft water previously to the application of the fixing agent. The mixture will not restore the cracks in a painting, but simply fixes the colours, and renders the painting very elastic. A mixture of one part of methylated chloroform and two of linseed oil is used for reviving the colours of paintings. A small portion is rubbed over the pictures, after washing with cotton wool, and on the following day the painting is wiped over with a soft silk handkerchief. Oil and chloroform, when used in the proportion given, possesses the property of restoring the faded colours of paintings, and develops colours which have perished to the eye by age."

Nothing is more conducive to success in copying engravings than having the original well stretched and mounted. We have seen the attempt frequently made to copy a print carelessly pinned up with more or less of irregular creasing and cockling all over, and giving a common imperfect effect in the photograph. Here are valuable hints on mounting engravings properly :—

" *Engravings.*—If it is an ordinary engraving it will be best to prepare a stretcher as before recommended, and strain evenly thereon a piece of calico by means of tacks round the edge. The tacks should not be too wide apart, or the calico will not be so firm. The engraving is laid on the bench face uppermost, and the edge of the stretcher laid across it from one edge of the picture, when, with a rule, the width of both margins can be ascertained. By halving this the exact width of margin can be seen, and by marking the picture in two places on each side a straight-edge can be used, and a line drawn where the picture must be cut. The margin on the top and bottom of the engraving can be easily decided, as the top must be measured off the same width as the sides, and the bottom can be marked by putting the edge of the stretcher on the top line, and marking the picture by the other edge of the stretcher. The engraving, when cut, is now just the size of the stretcher.

" On a good smooth surface, sheets of clean paper should be laid, and the engraving turned over on its face. With a clean sponge and water go over the back of the picture till it has absorbed almost as much water as it will take, when, after lying in the water a short time, a good coat of paste must be laid on very evenly, taking care that it contains no particles of grit. The stretcher must be evenly laid on, and well rubbed down by the hand over the calico at the back of the stretcher. The picture now on the stretcher can be turned up, and with a clean sheet of paper in the left hand laid on the outsides of the picture, and rubbed well down on the stretcher.

"Should there be any grit under the picture, which will be easily seen by the unevenness of the surface, it would be advisable to pull up the picture from one corner and remove it. If there is any dirt on the margin, now is the time to see to it, by applying the sponge with clean water, or it will not be removable when dry. Stains must be removed before mounting. The frame should be ready to receive the stretcher, and it should at once be tacked in and stood upright to dry. If not tacked into the frame the stretcher will twist with the drying of the picture.

"If the engraving be on India paper it will not be advisable to damp it so much, nor let it lie in the paste, but proceed as quickly as possible, as the India paper sometimes comes up, when it is a difficult matter to lay it again properly.

"Many other pictures are mounted in the same manner as before mentioned, but where it is an old engraving stained and discoloured, it will be necessary to clean it before mounting.

"Where gilt slipping is laid in a maple or other wood frame, the stretcher may be omitted by mounting the picture on the inside slipping in the following manner. The picture must be well damped with a sponge and clean water. The frame made of slipping must be well glass-papered down, and glued and laid on the picture in its proper place and well rubbed down. When dry it will be found to be well stretched, and the gilt will go under the glass. It should be tacked in the frame to dry, and when fitted up, a backboard used. This method is not suitable for large pictures."

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ACTION OF LIGHT ON EBONITE.

Mr. Herbert McLeod, writing in *Nature*, gives some interesting information relative to the possible changes in ebonite. As this substance is frequently employed for silver baths, dishes, camera backs, &c., the details will interest photographers. He says:—

"It is well known to electricians that the insulating power of ebonite gradually diminishes in consequence of the formation of a conducting layer of sulphuric acid on the surface (produced by the oxidation of the sulphur used in vulcanising). It is, perhaps, not so well known that exposure to light facilitates this change, if, indeed, it is not an essential condition.

"In order to put this to the test, a plate of ebonite (polished on both sides) was cut into four pieces, each about 52 mm. long, 22 mm. wide, and 8·5 mm. thick, exposing, therefore, a surface of about 3,500 square millimetres (the edges were not polished), and one half of each piece was varnished with an alcoholic solution of shellac. Two pieces were placed in wide test tubes plugged with cotton wool, and the other two were sealed hermetically in similar tubes. One of the sealed tubes and one plugged with cotton wool were placed in a dark drawer, and the other pair exposed to light in the laboratory, and during the latter part of the experiment to direct sunlight. The experiment was commenced on December 26, 1874, and after some time minute drops of liquid were perceived on the ebonite exposed to light and air, the remaining three pieces retaining their original appearance. Between September 1 and 21 of this year the sealed tube exposed to light was accidentally broken, so that for a period of less then three weeks the ebonite in it was exposed to both light and air. On September 21 the tubes were opened, the ebonite washed with water, and the amount of acid determined by standard solution of caustic soda. No trace of acid could be detected on either of the pieces of ebonite which had been kept in the dark; on the one which had been exposed to light in the closed tube, ·343 milligrammes of sulphuric acid were found, and on that exposed to light and air, 2·646 milligrammes.

"By a mistake it was not ascertained whether the part of the ebonite which had been varnished had become acid; but during the time of exposure small drops were also perceptible on this portion of the surface. When the pieces were exposed to direct sunlight another change became visible, the drops being replaced by what appeared to be small particles of a yellowish white solid. This may have been due to the heating of the black material by the sun, and consequent action of the strong acid on the solid.

"I was led to try this experiment by noticing that an ebonite plate electric machine which had been kept in a light room had changed in colour except on those portions which had been protected from light by the rubbers. The exposed surface acquired a brown colour, and the machine acted very badly. On cleaning the plate with a hot solution of caustic soda, large quantities of ammonia were evolved, and the brown surface became softened, so that it could be easily scraped off.

"I had an opportunity of noticing a remarkable instance of this action a short time since in the laboratory of my friend, Mr. Warren De la Rue. An apparatus with an ebonite base, with three adjusting screws, was standing at some distance from a window. The surface of the plate was covered with a fine dew of an acid liquid, except at the parts where the shadows of the heads of the screws fell. The surface at these places completely retained its original polish.

"The interest of this matter must be my excuse for communicating the results of an incomplete experiment."

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THE THEORY OF PHOTOGRAPHY.[*]

The chemical fact which is the keystone of photography is the sensitiveness of certain compounds or "salts" of silver to the action of light. Silver of itself is not affected by exposure to the sun. But it has this peculiarity which distinguishes it from every other metal—that a large number of its "salts," or combinations with other substances, become unstable, and tend to fall asunder, under the influence of light.[†] This is peculiarly the case with the salts that silver forms with those elements which we derive principally from the sea—chlorine, bromine, and iodine. In combination with most other metals, these elements remain unchanged, whether in the light or in the dark. But the chloride of silver, though it will remain quite stable in the dark, is separated into the chlorine and silver of which it was originally composed if brought out into the light; and the same is true of the bromide of silver and of the iodide under some conditions.

This tendency of silver to escape from these compounds in the presence of light is the fundamental fact upon which the art of "drawing with light" is built. For this escaped silver is not like silver as we know it in mass—a bright white metal. In the state of infinite subdivision into which it falls when light separates it from the iodine or bromine with which it was combined, it is blackish brown or purple. This released silver is therefore the pigment with which the sun paints his picture. Wherever his ray falls upon a sensitive silver salt, there, after a time, the mark of its presence is left in a patch of black silver; and the mass of this silver is greater or less, according to the length of time during which a ray of light has fallen on it. The photographic process in its simplest form consists in simply guiding the incidence of this ray. A plate covered with a sensitive salt of silver is put upright into a dark box, known as the "camera," which has a round hole at the other end, and in this round hole is screwed a lens. The lens throws upon the plate a picture of the objects opposite to it, and each of those objects leaves its mark of reduced silver upon the plate. Those which reflect much light, such as the sky or a white dress, leave a very dark mark; those which reflect less light leave a less decided mark; and those which reflect little or no light leave no mark at all. Thus the rays of light describe, in monochrome, a complete picture upon the sensitive salt of silver; only it is a picture with this peculiarity,—that everything white is represented black, and everything black is left white. Such a picture, however, if left at this stage would be a very useless achievement. It could never be brought out into the daylight to be shown; for the same light that had darkened special portions of the plate would then infallibly darken the rest. This difficulty actually did for a considerable time obstruct the efforts of the first discoverers of photography. They contrived to make pictures of some sort, but nothing had been discovered to remove those parts of the sensitive surface which had been untouched by light; and, therefore, they could only show their pictures to their friend, in a dark room.* Fortunately, it was discovered that one or or two drugs—such as cyanide of potassium, hyposulphite of soda, and some others—have the property of dissolving salts of silver, while they leave silver itself unaffected, or, at all events, affect it far more slowly. Of course, if a plate is treated with one of these drugs, all the salts of silver which the light has not changed are washed away, and nothing is left behind but the darkened silver picture.

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[*] *Quarterly Review.*

[†] Several of the metals have salts which are perceptibly sensitive to light—gold, iron, copper, platinum, uranium, chromium; but no one of them approaches to silver in the number of highly sensitive compounds which it is known to form.

Such is, in its simplest form, the process of photography. Practically, it is necessary that more complicated modifications should be introduced in order to adapt it to the uses which it is required to serve. The unassisted action of light, even upon the most sensitive salt of silver, is comparatively slow. Even under the direct ray of a midday summer sun, some minutes must elapse before the full reducing power of the light is exercised. In the comparative obscurity of the camera, into which the whole of the light that comes is reflected light, and has to find its way by one small hole and through the thickness of one or more stout pieces of glass, the exposure which would be requisite to produce any perceptible effect would be enormously long. For objects that are absolutely still, such as buildings or pictures to be copied, it is possible that with certain processes the unassisted ray of light might be left to draw its picture without any insuperable inconvenience. But no landscape that included foliage, still less any picture into which human beings entered, could be taken by an art which would require some hours of immobility for its success. It is necessary, therefore, that the sun should be helped, or, to use photographic language, it is necessary that the latent image his ray has left should be developed. If the subtlety and delicacy of the chemical laws involved be taken into consideration, the development of the latent image is a more remarkable process even than that by which the sun can be made to draw in silver. Certainly, it is one without which photography could never have become an art, and would probably have remained little else than a chemical toy.

If a sensitive plate—*i.e.*, a square of glass coated with bromo-iodide of silver—be exposed in the camera for two or three seconds, and then taken out and looked at in a dark room, it will seem to have undergone no alteration whatever. It will still present the creamy white look natural to those salts of silver. Even if it be submitted to the most powerful microscope, no indication of change will be detected. But the sun has done his work nevertheless, though he requires assistance. The elements of a picture are there, though not a line is to be seen. The silver has not escaped from the combination in which it was held, and therefore there is no dark mark to indicate its independent existence. It is still detained in a reluctant partnership with the iodine or the bromine; but the union is rudely shaken. The light has not acted long enough to release it entirely; but a disturbance among the molecules, the commencement of separation, has been set up. If the plate were put away without anything further being done to it, that commencement would be abortive, and the action of the light would come to nothing. But chemistry furnishes implements by which the bond which the sun has loosened can be finally severed, the half-escaped silver set absolutely free, and the latent picture made visible to the human eye.

There are a considerable number of substances which have this power in a greater or less degree; but the only ones which possess it in sufficient vigour for the purposes of the photographer are, curiously enough, the two with which we are familiar in the composition of common writing-ink. Either tannin or iron forms the base of all the developers which are employed by photographers. Some years ago a preparation of tannin, known as pyrogallic acid, was universally employed More recently it has been abandoned by almost all photographers in favour of the proto-sulphate of iron; and simultaneously the custom has found favour of preparing the sensitive plate with two salts of silver, bromide and iodide, instead of with the iodide alone; changes by which a great saving in the necessary length of exposure has been effected. But the principle of the two developers is the same; and it is to the extraordinary delicacy of the task entrusted to them that almost all the difficulties of photography are due, and at the same time its most marvellous achievements. The office of these developers is what is chemically called "reduction,"—*i e.*, they reduce the salt of silver to its elements, and thereby disengage the silver of which the picture consists. But their task is a difficult one, in that they have to steer through a very narrow channel between two dangers, either of which is fatal to the picture. Their reducing power is quite sufficient, if they are applied in adequate strength, to reduce the whole of the sensitive plate, whether the light has acted on it or not—that is, to turn it all an equally dark black. This is naturally not the photographer's object. He only wishes the developer to act where the light has already acted—to reduce the molecules of the silver salt, where the sun has alredy given them a shake. He has, therefore, so to proportion the strength of his developer that it shall have exactly power enough, and not more than enough to complete what the sun has begun, but has not had time to finish * It must be vigorous enough to reduce the bromo-iodide of silver which has already been predisposed to reduction, without affecting that which the light has not touched. It is the necessity of this exact proportion which communicates its extreme delicacy to the whole process.

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* To the non-photographic reader, showing a picture in a dark room may appear to be a very Hibernian process of science. But in photography a dark room only means a room lit with red or yellow light. The chemical effect of light is almost entirely due to the rays in the upper part of the spectrum—the violet, the blue, and, to a less extent, the green. The lower rays—the yellow, the orange, and the red—are chemically inert, or nearly so, upon salts of silver. But for this lucky distinction between the chemical and visual rays, photographic manipulations would have to be conducted really in the dark, and photography would be an impossibility.

* It is only true in general sense, to say that the developer finishes what light has begun. The completed action of light by itself, and the inchoate action of light followed by development, are not absolutely similar. For instance, the darkness of an image produced by light alone will increase in proportion to the length of the exposure, until the whole of the silver salt exposed has been reduced. But an image that is to be developed loses strength instead of gaining it, after the proper period of exposure is passed. A film of iodide of silver that has been exposed much too long, becomes upon development almost transparent. Another curious difference is to be found in the relative sensibility of the various salts of silver under the two processes. Under unassisted light the iodide is with difficulty affected, while the chloride is very sensitive. Under the developer the iodide is very much the more sensitive of the two.

Freezing Mixture.—A mixture of nine parts phosphate of soda, six parts nitrate of ammonia, and four parts nitric acid, is a freezing compound which will cause a fall in temperature of 71° Fahr.

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CHARACTER IN PORTRAITURE.

Every visitor to the Photographic Exhibition must be struck with one prevailing characteristic in the portraiture—the amazingly high degree of manipulative excellence and finish which are present everywhere. In all that belongs to the manipulative or mechanical part of the art there is generally absolute freedom from fault. Spots, streaks, stains, at one time familiar enough in otherwise good work, are now no longer seen. There is scarcely a portrait shown which is not characterized by delicacy of gradation, detail, and modelling. There is some considerable difference, it is true, in the mode in which these qualities are obtained. In some pictures present these qualities are due to very high photographic skill, in which good lighting, exposure, and chemical and manipulative treatment are happily combined in securing the highest technical qualities. In others, the physical excellence of the picture is due to skilfu retouching on the negative. To the public eye the qualities in question are very attractive, and, however produced, are regarded as much the same thing. In fact, the presence of the skilled negative retoucher in an establishment has tended very much to reduce the intelligent and skilful photographer, who always produced high class work, and the careless, slovenly worker, who a few years ago was an unsuccessful fourth-rate man, to one level.

To excel now in photographic portraiture, and to secure success, demand greater effort and higher culture than were necessary a dozen years ago. Something more than merely technical skill is necessary. The infusion of æsthetic qualities into portraiture is becoming more than ever necessary; and of these qualities there is probably none more important than that which deals with the rendering of character. Expression in the face is of course important to this end; but not in the face alone: there should be expression in the pose generally; in the carriage of the head; in the action of the hands; in the direction of the eye. We recently asked one of our most distinguished and successful portraitists to what he especially regarded his marked success as being due. Modestly deprecating any especial claims, he replied: "I think there is one thing to which I do certainly owe much success, at least in giving satisfaction: I have always made a special habit of studying character, and that as rapidly as possible. The moment I see a sitter I commence studying habits, movements, and characteristics, so as to secure the unconscious traits before constraint or affectation have begun to disguise the true character. I form an opinion as rapidly and accurately as I can, and practice has given me some skill in this way, and also in embodying the results of such observation, and so securing characteristic likenesses which strike all the friends as being familiar and satisfactory." A glance over his examples of portraiture at once illustrated this position. The photography was in all cases excellent, and the general pictorial character of the work was of the highest; but beyond all this there was an air of naturalness, a harmony between the pose, the expression, the features, which at once suggested a living actual character, not a mere simulacrum.

We unhesitatingly set down this element of characterization as the most important element of all in portraiture, and demanding consideration prior to either technical or pictorial considerations. We recently heard an anecdote which has some bearing on the subject. Some admiring friends were anxious to secure a painting of a philosopher who is probably the profoundest thinker of the age—one who has certainly made a deeper impression on the tone of thought than any other man of his time. He had consented at length, under certain conditions, to sit to a painter of high reputation. The rugged, grand head would admit of pictorial treatment easily enough, but the figure, quaintly attired in utter disregard of pictorial effect, was less easily dealt with. To meet this difficulty the painter had thrown the well-known cloak of his sitter over the lower part of the figure in negligent massive folds. Chancing to examine the progress of the painting one day, the philosopher noticed this arrangement of the cloak, to which he at once objected. "What's this? what's this?" he exclaimed, in his broad, Dumfriesshire tongue, to which we shall not attempt to do justice in spelling. "What's the meaning of putting my cloak here?" The artist explained, "You are just supposed to have called on a friend, and thrown your cloak over your knee." "Sir, I should do nothing of the kind; I would not be so unmannerly. In visiting a friend, I should just hang my cloak up in the hall, and not take it into his sitting-room." The objection, it is true, was a mere trifle, and the disposal of the cloak a natural artistic device; but it struck the direct uncompromising mind of the sitter as unlike his habit, and, therefore objectionable; he did not wish to go down to posterity characterized by an "unmannerliness" to which, all unconventional though he may be, he felt was not like him.

The art to find the mind's construction in the face, and to give it due rendering, to catch the familiar trick of action and position, and so embody it that everyone shall recognize it, even if no feature were shown, may involve natural qualities not given to every portraitist; but everyone who aspires to the highest excellence should study to acquire the ability. The study of Lavater will prove an excellent preliminary to the actual study of men. We reprint in another page a capital essay on outward indications of character, which recently appeared in a weekly contemporary, the *South London Press*, signed "Rupert." It, perhaps, does not virtually concern a photographer to know whether his sitter is a knave or an honest man, and if he determine that he is a knave it may be unwise to take much pains to make him look like one, but the essay in question will nevertheless interest our readers, and afford many of them hints in the study we are commending to their attention.

Our aim at present is simply to impress our readers with the importance of the subject, which has been thrust upon our attention during recent visits to the Photographic Exhibition, when we have been impressed with the uniformity of the appearance of scores of sitters, not only the portraits from one studio, but there is a dead level of smooth inanity in many of the portraits from various establishments. This, as we have said, is partly due to the prevalent habit of excessive retouching, and partly to the equally prevalent aim to secure smoothness, softness, and what is regarded as "finish," rather than to secure striking and characteristic likenesses. One of the earliest displays of photographic portraiture contained perhaps, the most spirited and characteristic series of likenesses ever produced by the art. We refer to the series of calotype portraits by Messrs. Hill and Adamson. They were all portraits of distinguished men, and they all looked like real, living men with strongly-marked character. The style was broad and forcible, with none of the refinement which is found in modern photography, and the difference between the portraits we speak of and those of the present day is not at all in favour of the latter. We hope in a future article to refer to the subject in detail; at present our end is served if we call the attention of readers to an important point too much overlooked.

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THE PHOTOGRAPHIC EXHIBITION.

Amongst the most interesting contributions to the present exhibition, allied in some respects to reproduction, but also requiring the far higher skill of composition, are the floral photographs of Mrs. S. G. Payne. In these we have, besides very happily combined pictorial groups of choice flowers, arranged with great taste and skill, some designs with special ulterior aim. Here is a design for a fan, in which choice examples of choice flowers are arranged in a semicircular curve of the right shape and proportions for a lady's fan. Admirable taste, great skill, and rare patience have been exercised in selecting, combining, and coaxing the flowers to dispose themselves in the required lines, and forming one harmonious group so complete in its unity, that the spectator might imagine the flowers grew in that form, and that nothing was more natural than that groups of flowers should grow in clustering variety, forming perfectly-arranged designs for fans. Here we have a design for a drawing-room panel, or, more correctly, for a stile to divide panels (103). We have the same sense of fitness in the running free style of the design. So also in the designs for Easter cards. In some of the floral groups other little bits of nature are included, such as a yellow-hammer's nest, and the nest of long-tailed tit. In all these examples of artistic photography in a comparatively new direction, there is, besides fine taste and loving interest in the work, a high degree of technical skill. It is a somewhat crucial test of manipulative ability to photograph the brilliant and varied colours of groups of flowers in a manner to do justice to each, and secure at the same time the true sense of texture in each. Mrs. Payne is to be congratulated on a very successful and pleasant series of contributions to the exhibition. Also allied to reproduction are the excellent photographs of Japanese china (or, more accurately, porcelain) contributed by Mr. G. H. Dunmore, No. 5, and No. 100. These interesting examples, consisting chiefly of vases, are admirable photographs, rendering the texture of the surface very satisfactorily.

Amongst the exhibitors of copies of drawings and paintings, Mr. Hollyer is, as usual, one of the most successful; his contributions including works of very different character, from oil paintings to pencil drawings. A portrait by Mr. J. Pettie, R.A. (189) retains admirably the characteristic texture of Mr. Pettie's work. A Crimean Hero (176), consisting of the portrait of a noble horse, is very excellent. His copies of paintings by Val Prinsep, and of pencil drawings by Miss Coleman, are also very satisfactory. Two copies of paintings by Sandys, exhibited by Lombardi and Co., curiously illustrate the difference between success and failure in reproduction. There is probably no painter of the present day more accurate in drawing, so carefully minute in detail, and whose work, besides its great art excellence and fineness in colour, possesses such photographic fidelity. In the portraits of Miss Chappell (127) all this minute fidelity is admirably shown, and at first glance the portrait looks like a photograph from life. In another example by its side, a portrait of Sir William Rose, by the same painter, the result is woefully different. It possesses nothing suggestive of the work of a really great artist, as Sandys most undoubtedly is. The copy is flat, grey, and scratchy. Doubtless the colours of the pictures have presented difficulties, and these have not been overcome. The copies from paintings and engravings exhibited by the Woodbury Company are very successful and satisfactory.

A reduced copy of a combination picture of the "Holderness Hunt" (141), a series of portraits, chiefly equestrian, contributed by Mr. G. Cooper, will doubtless constitute a very interesting picture to the members of the hunt and their friends. As an artistic production, it possesses something of the same defect as the picture, similarly produced, of which we spoke last week, namely, a suggestion of its piecemeal method of production, and consequent lack of unity in design. The portraits produced from different negatives are printed in to form one picture, which the artist supplements by the addition of accessories, background, &c. The method, of course, involves much labour, and securing the fidelity of portraiture, which is sometimes valued beyond pictorial excellence. A portrait of Mr. Ruskin (213), a nearly life-size bust, is exhibited by Mr. B. W. Andrews, and described as "finished in Mr. Andrews' new tint." The general effect is that of a drawing in bistre, and it seems doubtful if the picture is a photograph, or simply a drawing after photography. No. 144, a copy of a cartoon by Leonardo da Vinci, in the possession of the Royal Academy, will interest many besides art students. The character and condition of the cartoon make it a very difficult subject for photography; but it has been fairly done.

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FRENCH CORRESPONDENCE.

The Chemical Constitution of Guncotton: Experiments of MM. Champion et Pellet—M. J. Girard's Microscopic Researches upon the Collodion Film—Fogging—M. De Courten on Wet and Dry Plates.

MM. Champion et Pellet presented to the Academy of Sciences at one of its recent meetings, a note upon the composition of various kinds of pyroxyline. The experimenters had studied especially the Abel compressed gun-cotton, the paper pyroxyline, and Russian collodion, and their process of research was based upon the fact (recognized by them, and very important from a photographic point of view) that organic substances containing nitric acid are completely reduced under certain conditions by iron salts, and behave like nitrates.

According to the state of aggregation of the cellulose and the time of immersion in the nitro-sulphuric acid, you obtain nitrated compounds which contain different proportions of nitrogen. The compressed gun-cotton prepared by Mr. Abel's method only contains three equivalents, while the Russian collodion, whose excellent qualities are well-known, has as many as five equivalents. Paper pyroxyline contains but two equivalents.

If, as we have good grounds for hoping, these gentlemen continue their researches, the latter will, in conjunction with the microscopic results already contributed by M. Jules Girard, afford us considerable information respecting the photographic collodion film, about which we know so little at present. With more information at his fingers' ends, the photographer would be able to work with far more accuracy, and if he met with failure, would be in a position to set himself right again. Thanks to such investigations as these, he will be able, like the surgeon and the physician, to work more in the light than he has hitherto done, and steer clear of dangerous and critical matters.

M. J. Girard, of whom I have spoken, has just sent me some details which complete his memoir submitted to the Academy of Sciences, and of which I gave an account to your readers recently.

When a film of collodion is examined under a microscope, from the time that it is plunged into the silver bath to the moment when the image is definitely fixed, many modifications are to be observed in its molecular texture. These modifications, in the first place, have a character of their own according to the reaction to which the plate is subjected; and afterwards have variations which are the result of the elements that may be present, and which are always changing. These changeable effects play an important rôle in photographic manipulations, for there are grounds for supposing that in determining by means of the microscope the effects produced in the impression of the sensitive film, you may discover the elements necessary for an investigation into the failure of a plate.

The crystals of iodide of silver which are formed upon the collodion during the process of sensitizing in a neutral silver bath vary according as the collodion is old or new. In the first case the surface has an articulated appearance, in which irregularities of whites may be distinguished. In the second case, it is covered with crystals of a characteristic nature which are uniformly spread over the surface; but in those parts where the nitrate of silver has been in excess, other crystalline forms of star or rose-like shape are seen in patches visible to the naked eye.

If the plate has been washed on its exit from the bath after sensitizing, there will remain no crystals apparent upon its surface; different reactions are, however, manifest in the case of collodion more or less old, being plunged into a silver bath.

The silver reducer, whether it is aided by means of sulphate of iron or pyrogallic acid, renders the blacks and half-tones apparent by forming a precipitate upon the crystals, infinitely small, incorporated in the thickness of the sensitive film; the same reaction is also produced upon those adherent to the surface, but these have no influence upon the film proper. This excess is maintained by capillary action, and in the photographic image is designated by the name of fog. It is certain that this multitude of crystals is upon the surface, since it is possible to remove the fog by rubbing the plate with a wet tuft of cotton wool, if the film is only tough enough to withstand such operation.

In examining any negative with a magnifier of $^{\underline{800}}$, M. Girard adds, that there may be observed in the clearer portions, which are the most diaphanous, crystalline molecules measuring not more than half of a hundredth of a millimetre, and it is these that form fogging. In the second place, if the observer will follow the tint as it progresses in intensity, he will see that they in the end form a screen impenetrable to light. The latter decomposes in a latent manner the salts of silver of which the crystals are formed.

In a recent letter from M. le Comte de Courten, that well-known amateur submits, *apropos* of dry plates, some observations which it may be well to put before the readers of the Photographic News. My skilful correspondent says that a plate prepared for employment in a dry condition does not differ from a wet plate, except by reason of its conservation in a dry state, and its exposure to light in that condition. But in all operations, with the exception of the exposure, it is necessary that the surface be constantly maintained in a wet state, for the simple reason that unless this is so the chemical reactions could not go on; for chemical substances possess mutual action only when in a liquid form.

The preparation of a dry plate may be divided, therefore, into two distinct phases: the first, which includes the operations of collodionizing and sensitizing the plate, its washing, and the application of the preservative; while the second has to do with the washing, development, and fixing. Thus, on the one hand, after its immersion in the silver bath until the application of the preservative, the film remains constantly wet; and, on the other, after its exposure in the camera, it must be moistened again until all the non-impressioned iodide of silver has been eliminated. At the same time, as soon as the latent image has been developed, you may suspend the whole operation, to take it up again later on, provided you have first of all taken care to remove the whole of the active reagent by washing; the operation may then be resumed at leisure if you take the precaution of immersing the plate in pure water.

Thus, in the first place, that of preparing the sensitive film, it is indispensable that the latter should not cease for a moment to be damp and permeable throughout its thickness; while, in the second place, from development to fixing, the film may remain dry, and, for a time, without inconvenience. Ernest Lacan.

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INCONGRUOUS COMPOSITION IN PHOTOGRAPHS.

Mr. E. K. Hough writes in our Philadelphia contemporary what is styled a "little gentle criticism" on some of the contributions to the photographic display in the great exhibition. His remarks are not unkindly, but they are shrewd and instructive. He confines himself to the works of some of the most distinguished American artists, whom he mentions by name. The suggestion which occurs is, if these really capable men are guilty of such oversights, it will be instructive to all photographers to have their attention called to glaring errors into which it is easy to slip. As it will not serve any purpose to gibbet these artists at a distance by mentioning their names in conjunction with the errors, we will omit names. He says:—

"On the screen facing the entrance has two pictures of single figures in landscape form, requiring an unusual arrangement of accessories. In the one of the man reclining with his feet elevated, there is a curtain pulled across to preserve the balance of lines, and thereby exposing beneath, the standard which held the curtain, with its foot projecting into the picture. Now that is a fault not worth mentioning, you will say; but it struck me painfully; much as if a portion of the fair flesh on the face of beauty had been pulled aside, exposing the bony frame-work—the ugly skeleton—beneath. I thought if such oversight can be shown by such a man in such a place, there must be more, and worse, by others; I will look especially for them.

"Next came the splendid display of——, and sure enough there was one large picture of a lady in riding habit, standing in a room bare of accessories, with a background intended to represent a large piece of elegant furniture and a frescoed parlour wall, but with the whole effect destroyed by a baseboard with the black shadow beneath extending in an unbroken line across the picture, giving it a grotesque effect of theatrical unreality. It seemed strange that operators capable of producing such uniformly fine chemical effects could have so little artistic feeling as to produce and exhibit such a picture. But hanging near it is another the same size that increases the wonder to amazement.

"A lady in light dress, standing with her back to a bright moon-lit landscape, with full moon in sight shining broadly, with the bright lights and deep shadows of moonlight over all the distance, and up to within ten feet or so back of her, when (miracle of nature or art) the moonlight abruptly ceases, and upon the lady and all the foreground shines a strong sunlight effect from the contrary direction, the moon shining from her right towards the left, while the sun apparently shone from the left towards her right. Moreover, the sun must be three or four hours high, judging by the shadows—an angle of about 45°—so it is not evening, and yet the moon is shining brightly in midsky. And, if the moon could be visible thus in daylight, it could not possibly be a full moon, but must show as a narrow new moon, thus doing violence to a truthful representation of nature in every way. Yet, as photographs go, it is a good picture, clean, sharp, and brilliant, and you can easily say one need not be so 'pizen particular.' But these totally unnecessary faults are of the kind that give art critics opportunity to say with sneers that photographers are mechanics, not artists; and were a painting shown with such errors, how the painter would be scourged by the critics! Yet why is it any worse in one case than the other?

"The next similar fault I noticed was in the exhibit of ——, of Detroit, being a picture of three ladies in what purports to be an opera-box—the box represented so slight and fragile that you feel it is a painted screen, and fear it will tip over any moment and carry them down with it. Its unsubstantial nature is further shown by the thin, sharp edge, against which the lady leans, that looks as if it would cut into her shoulder with the least pressure. It is a well-established principle of all architecture, that every support should look as if it were strong enough to hold the weight imposed upon it; and even if a column is strong enough, but looks too slight, it must be built up large enough to look strong, or it gives a feeling of insecurity and subsequent discomfort to the observer. The principle applies equally to pictures, and the contrast is distinctly shown by a similar picture in the exhibit of Mr. Wm. Curtis Taylor, of three persons in an opera-box which has a satisfying appearance of substantial reality.

"Mr. ——, of Rochester, has a noble exhibit of large pictures with only one of them bad in the faults of which I am now speaking; that, however, is very bad. It is the group of a lady sitting and a gentleman standing, the background printed in from an engraving apparently enlarged until the lines are coarser than a woodcut, also the column and vines near, with a Cupid peeping out upon the supposed lovers. There is a total want of harmony between the foreground and background. The carpet runs back under the tiled floor without any pretence of realistic effect; the outlines of figures blend imperfectly with the ground: in short, a jumble of line engraving with the mezzotint of photography that compels one to say, it is neither 'fish, flesh, or fowl, nor good red-herring.' The artistic oversight that could mar so noble an exhibit of its triumph over the technical difficulties of photography, by showing one such picture, seems almost incredible.

"The next in order is the exhibit of ——, of Chicago, a large picture of a lady at an easel, with part of the background an open-air scene, in which the carpet runs under the grass in an impossible way, while the foot and castor of the screen are distinctly shown; while, worse than that, in the fine large picture, 'Dressing the Bride,' there is represented an open window looking out upon a landscape clearly shown, but the ground probably being too short, a slip has been put in to eke it out, and this slip also represents a window looking out upon totally different scenery, presenting the marvel of two different landscapes seen out of the same window.

"Now these may seem trivial faults to most photographers because, in various ways, they are constantly committed, as swearing and drunkenness are regarded as slight offences in communities where they are constantly practised. But the exhibits of others among our native exhibitors show that all such glaring incongruities can be avoided without appearance of effort, or, if they make pictures with such faults, at least they do not exhibit them."

THE ZINCOGRAPHIC PROCESS.*

Intensifying the Transfer by Rubbing.—A solution of gum arabic of the consistence of medium collodion is made, and to one hundred grammes of it are added three grammes of phosphoric acid. These are thoroughly mixed together and applied to the plate by means of a soft sponge, so that the surface is properly covered with the solution.

Upon a lithographic stone is rubbed a little transfer ink, moistened with oil of turpentine, and with the help of another little bit of sponge a thick paste is made, which should be without lumps. The transfer ink in this dilute form is conveyed by means of the sponge to the plate, without, however, having removed the gum mixture. You rub the plate with the sponge containing the ink, and after a time it will be seen that the image becomes much strengthened by the operation. The rubbing may be continued until all the lines are vigorous; but great care must always be exercised the while, and the plate continually kept moist by means of the gum mixture.

After the operation is complete the plate is rinsed with clean water, and dried gently with a soft linen rag. There should remain no trace of the gum upon the dry plate.

The Dusting of the Transfer.—Some clean pale resin is rubbed fine in a mortar, and then passed through a delicate hair sieve. The finer the sieve the better will be the result. Even if some time is taken in sifting the resin, it is well worth the trouble, for the work will be all the better for having the powdered resin in so fine a state of division.

With a tuft of ordinary cotton wool a little of the resin powder is spread upon the plate, and rubbed uniformly over the transfer. This is continued so long as the transfer keeps on taking up the powder, and then the plate is cleaned by the aid of a broad badger-hair pencil.

The back of the plate is next coated with a thick solution of asphalte dissolved in oil of turpentine, and at the same time the margins of the plate, up to within one-fifth centimetre of the image, is also covered with asphalte solution. After this treatment with asphalte varnish the plate is dried, and is then in a condition to be etched.

The Etching of the Zinc Plate.—A shallow porcelain or gutta-percha dish is filled with water to the height of two centimetres, and into the water is then put a solution of ordinary gum arabic in the proportion of one to fifty, a larger or smaller quantity of gum having little effect upon the result. Into this very dilute solution of gum is carefully added as much nitric acid as renders the water slightly acid to the taste (about 1° Baumé).

Into this etching solution the dry zinc plate is put, and allowed to remain for some time, while the dish is rocked to and fro; this is easily managed by putting under the middle of the dish a wooden lath, so that the receptacle is tilted backwards and forwards with ease. If the liquid is allowed to remain quiet upon the zinc surface, gas bubbles are likely to form upon the zinc, and these would infallibly destroy the finer portions of the image.

The plate, which was in the first instance perfectly bright, gradually becomes of a dark grey tint, and, after a time, there are to be seen upon the surface bright patches in places. At this point the plate is taken out of the solution and transferred to a vessel of clean water, a wooden receptacle being best suited for the purpose. After it has been thus washed, it is softly touched all over (not rubbed) with a soft sponge, the latter being from time to time pressed out; and this operation is continued until there remains but little moisture upon the plate. The plate will now show, although to a very slight degree, a notable relief of the lines.

The zinc plate is now placed upon a wire gauze, which rests upon feet about thirty centimetres above a table in such a way that there is a space below it. The face of the plate where the transfer is must be uppermost. The plate is then warmed by the aid of a gas jet, which is fitted to an india-rubber tubing, so as to be capable of being moved about, and the zinc heated until every bit of moisture has been evaporated, and the image appears clean and black. If a gas flame is not handy, then a spirit lamp may be employed with equal effect.

While the plate is yet warm, a little of the gum and phosphoric acid mixture previously employed is applied to the surface by means of a small bit of sponge, and this liquid is allowed to dry upon the surface, as it soon will do, before the plate is quite cold. Then the plate is put upon the table and freed from the gum by a wet sponge, the sponge being squeezed occasionally, so that as little moisture as possible may remain upon the plate.

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* Continued from page 495.

In the meantime a quantity of medium litho ink has been rubbed upon a stone with the litho roller, and over the plate this roller is passed two or three times, considerable pressure being brought to bear. If the plate has the appearance of becoming dry it must at once be moistened with a sponge, but, at the same time, not rendered too wet. The whole of the plate is treated in this way until one finds, by pressing the finger upon it, that sufficient ink is adhering. Care must be exercised, in this first treatment of the plate with the roller, not to apply too much ink, or ink of too light a character, for such a step would at once place the further successful etching of the plate in jeopardy, from the circumstance that all the fine portions and thin lines would cake together. After the drying of the plate, which must not this time be undertaken with a gas flame, the transfer is once more powdered over with fine resin dust. The refuse should never be used again, as it always consists of the coarser particles.

After this second dusting with resin, and the removal of the superfluous powder by the badger hair pencil as above described, the plate is put into the etching bath again, where it should remain rather longer than before, and, after washing, it is subjected to a third etching operation.

The plate is then put upon the wire gauze once more, and again warmed from below, but only gently, and not heated to any degree. Then a stronger acid bath may be employed for etching, so much nitric acid being added to the water that it tastes like vinegar (about 4° to 5° Baumé). This is called "deep-etching" the plate.

(*To be continued.*)

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AN ACTINOMETER.

The *Scientific American* says:—"Mr. William A. Brice, of London, England, has patented in America a novel testing plate, which will enable photographers to determine with considerable certainty the quality of the chemicals employed, the quick or slow working of the lens, and to define whether the presence of 'fog' or want of clearness in the picture is attributable to impurities of the chemicals, alkalinity of the bath, diffused light, over-exposure to light, or to other causes.

"The invention consists of a frame with a sliding glass plate, to which are applied fixed pieces of transparent material superposed in layers of one, two, three, and more, in regular succession, to produce a greater or less obstacle to the passage of the light. This is set up between the lens and the sensitized plate, and the picture is then taken in the usual manner. The result is a picture which produces the light shade or shadow of the object to be photographed with the chemicals and lens, and with light of more or less the same actinic quality, intended to be used for the picture to be taken. When the picture is developed on this plate, it is, while visible, wholly divided into sections of unequal intensity, being more or less distinct, according as the light has passed through one or more layers. The absence of fog where the light has been transmitted through several sheets of transparent material indicates that the chemicals are pure, that there is no diffused light, and that the nitrate bath is of proper acidity. If at that section details of the picture are clearly developed, it may be concluded that the exposure has been sufficient with the lens, light, and chemicals used. The second section of the testing plate, where the light passes through a less number of layers, gives more or less the same information, but indicates more clearly whether the exposure has been adapted to existing conditions or not. The next section indicates, if properly developed, what time, chemicals, &c., are to be used for the picture to be taken; while the middle or uncovered section indicates by the evident over-exposure that the lens is good and rapid in action, that the chemicals are in good condition, and that the light is sufficient in actinic power to produce good pictures with rapid exposure. The device is one which photographers will doubtless find labour-saving and of much general assistance."

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Correspondence

YELLOW SPOTS ON PRINTS.

Sir,—Along with "Snowstorm" and others I have also taken an interest in the remarks in the Photographic News on "Spotty Prints," and am fully convinced that gold (? bronze) printing is a very fruitful cause of the complaint, so that I always carefully keep all bronze powder out of the reach of my paper or prints, and by no means will allow gold-printing on my cards. "Snowstorm" asks how it is with a number of cards lying in an album, all printed with gold, that only a portion of them go spotty? Although I am not troubled with spotty prints, I will suggest as the reason the different qualities of bronze used in printing, and the different materials used in mounting the prints on the cards. If gelatine or glue be used, it is liable to absorb a little moisture during damp weather; whereas if starch, paste, gum, or a solution of india-rubber be used, they are not all equally liable to the same atmospheric influences as if gold printing be used; in each case, those mounted with glue will be most liable to become spotty. With respect to the gold powder (which, bye-the-bye, is not gold at all, but a combination of tin, mercury, and sulphur, mixed in all imaginable proportions) giving different shades and qualities, which, brought into contact with silver prints, if only damp with atmospheric moisture, will give a spotty print. Then the various methods of printing and mounting would give rise to the "inexplicable mystery" of "Snowstorm."

It may be that the bronze powder may be thoroughly imbedded in the size or varnish, or it may be loosely thrown about on the mounts; in the one case, being free from, and in the other being a fruitful source of, the complaint. For a "perfect cure," I, for one, would say, have nothing to do with bronze-printed mounts; only look at the materials that are brought together—silver, sulphur, mercury, tin, and moisture—and ask whether they are likely to remain permanent.—Yours truly, Sutton-in-Ashfield.

THE PHOTOGRAPHIC EXHIBITION.

Sir,—The correspondent writing in your contemporary, signing "A Member of Council," is manifestly a meek man. He has received a stinging castigation from Mr. Heath, who describes him as the writer of a letter which was "ungrammatical," "in execrably bad taste," "laboured, stilted, and obscure in style," "totally lacking judgment and discretion," "very silly and extremely indiscreet." In short, "the council has just reason to be ashamed of the member who can so write, for no words can sufficiently condemn his style, taste, and sentiment." Mr. Heath's chastisement has not been without its effect, for the "Member of Council" apologizes, and protests that he did not refer to Mr. Heath in the silly, indiscreet, and ungrammatical letter. This, sir, is so far so good. But he is still confused in his ideas, or wishes to confuse others, and either from incapacity to comprehend, or mendacious disposition to misrepresent, he utterly mistakes the purport of my own letter, and that of "A Country Member." The case stands thus: "A Country Member," lamenting the sad falling off in the Exhibition, pointed out the leading causes: these were the unsuitable date at which the Exhibition is now held, the baleful influence still exercised by the unhappy disruption in the Society, the ill-judged style of hanging adopted, and the prohibition of names, &c., appearing on the pictures or frames. As an old member, anxious to see these causes of failure understood and removed, I endeavoured to give emphasis to the complaint by citing special illustrations of the grievance. This "A Member of Council" calls an attempt to divert readers from the "true issue"! The true issue of his former letter appeared to be the discharge of some vulgar personal inuendoes which I do not profess to understand. In his last letter he professes to restate the "true issue."

He alleges that the falling off is due to the dissatisfaction caused some years ago by the awards of medals and money prizes, by which the Society was "*mortally* (?) sticken." Now if his statement were true, it only adds another cause of falling off, without controverting those already alleged. But the "Member of Council" goes on to state it was the maladministration of the Crawshay prizes which gave this "mortal" stroke to the Society. But how could that matter affect the Society, which had neither control nor responsibility in the matter? It was not a competition invited by the Society, nor managed by it in any way, nor had the Society or its Council any influence or control in the awards, some members of the jury, if I rightly recollect, not even being members of the Society. And this is the kind of nonsense which this *soi-disant* "Member of Council" thinks will satisfy the public and prove that much of the failure of the Exhibition is not due to preventible causes, which it is the duty of the Council to try, at least, to remove.

Any revival of discussion on the wretched disruption of a few years ago can only do mischief; I will not, therefore, point out the absurdity of the "silly and indiscreet" remarks on the notorious requisition. I must apologize, sir, for taking up more of your space than I intended. The case illustrates the mischief an insignificant writer may initiate. It seemed necessary to point out the fallacies and inaccuracies of this malignant writer of personalities, simply because by implication he used the name of the Council to give weight to his inuendoes. Had this not been so, not two persons would have dreamed of noticing him If they did, indeed, his letters would suggest no "extinct volcano," but a burnt out squib.—Yours, sir, obediently,

An Old Member of the Society.

THE PHOTOGRAPHIC EXHIBITION—A CORRECTION.

Dear Sir,—May I beg the favour of your correcting, in your next issue, a slight inaccuracy which has crept into your notice of the enlargements at the Photographic Exhibition. You state that the "fine head of Dr. Russell" is contributed by the Autotype Company; whereas it is really exhibited by the Woodbury Company. The error has doubtless arisen through a mistake in the catalogue.—I am, dear sir, yours faithfully, Thos. W. Fry.

ANNUAL TECHNICAL EXHIBITION OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

Dear Sir,—Will you kindly permit me to announce that the "Annual Technical Exhibition" of the South London Photographic Society will take place this year on Thursday, November 9th, at seven o'clock, in the Large Room of the Society of Arts, Adelphi. Admission free.

Any one desirous of exhibiting objects in connection with the same will please to communicate with me.—Yours faithfully, Edwin Cocking, Hon. Sec.

57, *Queen's Road. Peckham.*

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

Dear Sir,—Will you kindly allow me to announce through your columns that the President and Council of the Photographic Society of Great Britain have generously granted the exhibition, 5A, Pall Mall, East, on Monday evening, Nov. 13th (the last night it will be open), for the benefit of the funds of the Photographers' Benevolent Association. Tickets, sixpence each, can be had from me, or at the door of the exhibition.—I remain, yours truly,

174, *Fleet Street, E.C.* W. T. Wilkinson.

Proceedings of Societies.

Manchester Photographic Society.

The annual meeting was held at the Memorial Hall, on Thursday evening, the 12th inst., Mr. W. T. Mabley in the chair.

After the minutes had been read and past, the Secretary read the

Annual Report.

The annual report of the past session is not of the encouraging character your Council would desire to record. There are fewer members in the Society—sixty-eight against seventy-seven—and only four papers have been read during the year. This falling off in the matter of papers may have arisen from the fact that the members of your society are so fully satisfied with the process adopted by its leading practitioners that they have little or no disposition to experiment with the newer methods of producing negatives. Yet, whilst admiring the devotion displayed by these gentlemen in their adherence to what is known by them to be good, your Council are of opinion that a useful and possibly a profitable experience might be secured by more attention to and practice of the popular methods of the time. It is not to be expected, nor even advocated, that gentlemen should go abroad to secure pictures by any untried method; but, as a matter of study, it might be worth while to try what those processes of which we in Manchester seem to know so little are worth.

Amidst the fluctuations of the number of members, your Council are pleased to find the oldest and best workers are faithful to their little community; and, although set subjects for discussion have not been by any means numerous, your Council congratulate you on the fact that a fair amount of matter for all practical purposes has been forthcoming at almost every meeting. Still your Council feel that unless a constant effort be made to increase the number of members, and thereby the funds, and to benefit the Society in every way, it is certain to suffer.

Leaving these matters for your careful consideration, your Council find the following papers have been before you during the session:—

"On Art in Photography and Mr. Rejlander," by Mr. J. B. Forster; "On the Preparation of Emulsion Plates," by the Rev. Canon Beechey, M.A.; "On Prolonged Exposure by the Wet Process," by Mr. J. Pollitt; "On a Modification of the Collodio-Albumen Process," by Mr. W. D. Sauderson.

It is hardly worth while to recapitulate the other numerous and interesting objects and subjects that have come before you at the meetings, and for which your Council beg to thank all those gentlemen who so promptly responded to the wishes of the Secretary.

The attendance at the meetings averaged twenty-eight, being the same as during the previous year.

The twenty-first anniversary was celebrated at Alderley, on the 12th of August, when the small company assembled had a pleasant day's out.

Your Council cannot forego the present opportunity of urging all the members to renewed activity, and beg to tender their sincere thanks to each and all who have contributed in even the smallest degree to the interest of the meetings.

The Treasurer's accounts will be submitted to you for approval.

The annual report was accepted, and the Treasurer's accounts passed.

Messrs. W. Hellawell, W. C. Mountain, C. Pearson, and T. Sefton were elected members of the Society.

The election of officers for the ensuing year then took place, and resulted as follows:—

President: Mr. Alfred Brothers, F.R.A.S.—*Vice Presidents:* Rev. Canon Beechey, M.A., Messrs. Thomas Haywood, G. T. Luud, W. T. Mabley, and M. Noton.—*Council:* Messrs. John Brier, jun., W. G. Coote, J. T. Chapman, J. Fraukland, J. Pollitt, J. C. Sewell, I. Wade, E. Woodward, John Warburton, and N. Wright.—*Treasurer:* J. H. Young.—*Hon Secretary:* Charles Adin.

It was then resolved—"That cards of membership, signed by the Secretary, be issued to the members."

Mr. Lund showed a print from a negative taken on a collodio-albumen plate, sensitized seven years before exposure. It was evident, from the quality of the print, that the negative was clean and good.

Mr. D. Young showed some prints in printers' ink, but could not say how they had been produced, beyond the general statement that a film of gelatine on glass had been employed to print from.

Mr. Atherton presented three views of Chorley Old Hall to the Society's portfolio.

The customary votes of thanks were accorded to the Chairman and others, and the meeting was adjourned.

Talk in the Studio.

Soiree of the Photographic Society.—The members of the Photographic Society and their friends have been invited to a soirée, to be held in the rooms of the Water-colour Society, where the Photographic Exhibition is now open. The soirée will be held on Tuesday evening, the 31st inst., at eight o'clock.

Coming of Age of Mr. W. E. Downey.—An interesting festive gathering was recently held in Newcastle to celebrate the coming of age of the son of Mr. W. Downey, a name well known to photographers. The gathering included a large number of distinguished guests, and some able speeches were made on the occassion.

Social Value of Photography.—On the occasion just mentioned above, Mr. J. W. Swan made some excellent remarks on the social value of photography. He said he thought we did not sufficiently appreciate the value of photography in cultivating the affections of the heart and the mind. He thought we had yet to learn that all art tends to the cultivation of the heart, that there is a use in beautiful things, and that even utilitarianism may find in art something to subserve its own ends. Among the many uses of photography it was particularly valuable in making us acquainted with eminent personages; and no one had done more in the diffusion of that advantage than the Messrs. Downey. They had made us intimately acquainted with the Queen and the Royal Family; and, apart from their excellence as photographers, they had rendered a very considerable service to the cause of loyalty.

Obtaining Photographic Apparatus under False Pretences.—At Southwark Police Court, C. Mapleson, said to be a draughtsman in the service of the Great Eastern Railway, was charged with obtaining a set of photographic apparatus from Mr. F. W. Stanley, Railway Approach, on false pretences. Evidence having been given, the prisoner was remanded.

The Press and the Exhibition.—The *City Press* says:—"The Exhibition of the Photographic Society of Great Britain opened recently with a fine collection of specimens of this branch of art. We can only call attention to a few of its most note-worthy features, prominent among which are some splendid examples of Colonel Stuart Wortley's well-known studies in clouds and water. Mr. R. Crawshay sends some beautifully-executed Welsh views; from the Royal Engineers we have some excellent landscapes, while, through the Autotype Company, who are large contributors, Corporal Wilkinson, of the Thirty-ninth Regiment, exhibits a fine and well-finished photograph of the Cawnpore Memorial. The Woodbury Company and Messrs. Lombadi and Co. send a number of excellent portraits, and Messrs. Faulkner and Co. some of children (instantaneous), which are very good. As a whole the exhibition, though hardly so extensive as the preceding, is superior in effect, a result partly due to the improved hanging arrangements, and is well worthy of a visit. The gallery remains open until the beginning of November."

To Correspondents.

A. T.—The registration of a photograph is effected under the provisions of the Fine Art Copyright Act, with which, of course, the name of a patent medicine has no connection. Such a name may, we believe, be protected by the provisions of the Trade Marks Act; but it cannot be registered, or any protection acquired, under the Act which affects photographs and works of fine art.

E. Ludlam.—We fear that old scratched negatives are not a very marketable article. The silver obtained from 50,000 would possibly be worth recovering, if a plan were adopted which made the collection of the films moderately easy, such, for instance, as the immersion of the plates in a very hot solution of soda or potash, which will generally remove the films at once. If the films were then collected and dried, thrown into an open crucible, and submitted to a low heat to burn the collodion films, the residue might easily be melted by adding a flux and raising the temperature sufficiently. The plates should be removed at once from the alkaline solution and rinsed; then well cleaned with nitric acid and rinsed. As to disposing of them when the cleaning is completed, we cannot advise you.

Troublesome.—The shell-like marks are caused by the formation of air-bubbles on the surface of the solution, preventing perfect contact between the paper and the solution. Sometimes, if the paper is lifted at once and the air-bubble removed, no mark will be left; but in cases where the paper is highly albumenized and the solution weak, the mark of an air-bubble formed even for a moment is permanent. You must learn to put the paper on the surface of the solution in such a manner as to prevent the formation of air-bubbles. This is a question of manipulation which requires practice. Hold the paper by opposite corners, and double it slightly, so that the middle of the sheet touches the solution first, then allow each curved-up half to drop gently on the surface of the solution in such a manner as to drive any bubbles, if formed, to the edges, where they make their escape. The lines may arise from hesitation in allowing the sheet to fall on the solution, or they may be defects in the albumenizing. 2. If you had sent an example of the yellow prints which trouble you, we could better have decided as to the cause. But we have little doubt that the discolouration is due to imperfect fixation. You use the hypo solution too weak, or do not immerse long enough, and fail to keep the prints in motion. Or, what is most likely, you use the same solution over again to fix a second batch of prints. This should never be done.

One Anxious to Learn.—The presence of minute globules of moisture between the coloured transparency and glass in stereo-transparencies seems to indicate that some hygrometric substance had been mixed with the colours; the moisture under varying conditions of temperature evaporates, and, not finding escape, deposits in globules. Removing the glass and drying well by the fire, then putting up again, will remove the trouble. A cardboard mount will doubtless be an improvement, and tend to prevent repetition of the defect.

J. Nelson.—You will find on looking over our back volumes that many articles have been devoted to the treatment of the bath to prevent discolouration. One method consists in substituting three ounces of methylated spirit for three ounces of water in every pint of silver solution. Another consists in agitating the bath with a little carbonate of silver, and filtering each time before use. There are many other plans. If you place the sensitive paper between sheets of blotting-paper which have been soaked in a solution of carbonate of soda, and then dried, it will keep some time without discolouration.

C. B. C.—The chocolate colour (produced by Selle's method) is seen by reflected light, and is a fine brown. Of its permanency we cannot speak with certainty, as we have heard of cases where it has scaled; but we have not seen any. No mercury toning process is to be trusted. The brownish-black tint produced by sulphide of potassium is, so far as our experience goes, permanent. The most trustworthy warm tone is that obtained by development alone, without any toning process. This depends much upon skill in manipulation. A moderately new bath in good working condition, a collodion to match, full exposure to good light, and rapid development with pyrogallic acid freely acidified with acetic acid, give the general conditions; the precise details require working out and fitting to each other by a skilful and experienced hand.

C. J. D. (A Constant Subscriber).—We regret that we cannot help you to a fine artistic example of the ferrotype process. We think it is quite possible to improve upon the majority of those we see exhibited in show-cases as specimens—many of which have manifestly been produced in America. Many years ago, when collodion positives on glass had some vogue for portraiture, we have seen exceedingly fine and artistic examples, much superior to any of the ferrotypes we are in the habit of seeing. The great technical defect in the majority appears to be want of brilliancy. The deposit of silver forming the whites is dull and poor in colour, and is so thin that the black plate showing through gives the white a low, poor, grey tone. We should use a collodion with more body, and a protonitrate developer, carrying the development a little further than is usually done. This would give an image of greater brilliancy than is commonly obtained in the ferrotype process.

South Devon.—It would not be difficult, we suppose, to modify the scenograph to permit of the use of a pair of lenses; but it should be specially made for such a purpose. A little additional weight would, of course, be involved.

A. C. Heilbronn.—Selle's method of toning, which you will find stated in an answer to "Copyist" in our last, will give you good, warm, brown tones for lantern transparencies. You may easily obtain warm tones in pictures illumined by transmitted light, by using bath and collodion in very good working condition, giving full exposure, and short development with a pyro developer containing plenty of acetic acid.

B. B. (Gloucester).—We have published many articles on the subject. In our volume for 1873 you will find several articles with ful details.

D. W. W.—Thanks.

H. Warner.—Thanks. In our next.

Several Correspondents in our next.

The Photographic News, November 3, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

The Photographic Records brought Home by the Arctic Expedition.—Captain Nares and his gallant followers have returned from their expedition to the Polar regions, and, although we have since learnt a good deal of their adventures and trials, the sum of their efforts was contained in the brief telegram the leader sent off on his arrival at Valentia. The two significant words which travelled with lightning speed from one corner of the country to another constituted, in the main, the whole story he had to tell, and, although it was disappointing to hear it, the pleasure that the safe return of the two ships must give to every Englishman compensates in a great measure for any such disappointment. "Pole impracticable!" was Captain Nares' comprehensive report on landing; and if ever British sailors deserved success they were those who followed the hardy naval captain into the Arctic regions. That our authorities were justified in selecting Captain Nares, F.R.S., to command the expedition, having been recalled from China, where he was in charge of the "Challenger," is amply proved by the accounts that have reached us of his successful exertions to keep his crew in spirits, and breathe courage into their frames during the endless days and nights of an Arctic winter. We only trust that this will be the last expedition of its kind, at any rate for some time to come, and that those at home will have some sound and valid reason before sending out another such expedition. Our brave sailors got to within 400 miles of the Pole, the distance of London from Edinbro', and, therefore, it might seem to some that, with only this interval between them, the task might be accomplished. But there are no post-roads, unfortunately, in these regions, and that constant friend and guide of the sailor, the compass, is not to be relied upon when you get very near the Poles. The heavens serve as a good guide when the stars are shining, but in the case of a mist the traveller is again at fault. But the main difficulty, after all, is the difficulty met with in advancing. Scarcely a mile a day, we are told, could be travelled by the sledge parties, owing to the rough nature of the ice; and so big and massive were the ice boulders at times, that a détour of several miles had frequently to be undertaken. The Pole seems surrounded by unwieldy ice masses wedged against one another, and these are greater obstacles to surmount than rocks and stones that are met with occasionally at the sea coast or on a mountain side. The expedition has brought back with it a large collection of curiosities, fossils, algæ, and natural history specimens, but the most interesting of the momentoes they bring, at least to stay-at-home people, are the photographs which have been taken in the Polar regions, and of which a goodly collection is in existence. It was a series of these pictures which Captain Nares took with him when he hurried off to report himself to the Admiralty on his arrival, for nothing, he was aware, could give such colour to his narrative as a representation of the spots he had visited during his temporary banishment from civilization. When the expedition was being organized two years ago we at once pointed out the advantage that would arise from the provision of photographic apparatus, and strenuously urged that a camera, together with dry plates, at any rate, should be taken out. We believe that both Captain Abney, R.E., F.R.S., of Chatham, and Mr. Baden Pritchard, of the War Department Photographic Establishment, willingly came forward to lend what assistance they could in seeing that the ships were properly provided with requisite stores and apparatus for the practice of photography, and it is gratifying to learn that these have served their purpose. Photographs taken within four or five hundred miles of the Pole will be records that will be studied and examined with something more than curiosity, and they will go far to prove to those who stay at home, and take no part in such expeditions beyond that which can conveniently be performed without venturing outside their well-warmed homes or far from their snug firesides, what is possible and what is impossible. If we are shown blocks upon blocks of ice heaped together in confused masses, as the surface over which sledge parties must travel if they have a mind to reach the Pole, then, perhaps, we shall cease to prate about the narrowness of the space that separates us from success. These photographs, we contend, will do a great deal towards showing the matter in a right light to those enthusiasts whose entire knowledge of the region of ice and snow has been gathered from the coloured illustrations they have seen in books about Arctic voyages. For depicting Polar life, we should think photography would be admirably adapted, by reason of the phases of snow and ice scenery; and we predict that the views that have been secured will be regarded as among the most precious relics that have ever been brought home by navigators in those climes. Many of our readers, doubtless, remember the fine effects exhibited by the pictures which Lieutenant Chermside, R.E., took within the Arctic Circle, and which he showed at a meeting of the Photographic Society. The stretches of bleak land and coast, the interminable ice scenes, the rugged Nova Zembla shore, the desolate character of the bays and headlands, all were rendered with a truth and accuracy that could not be surpassed. The pictures which Capt. Nares brings home with him must be still more to the point as illustrations of life—or, rather, absence of life—in high latitudes, and we trust, therefore, that there will be some efforts displayed to get them made public. The dimensions of the photographs are, we believe, about eight inches, but they could, of course, be enlarged to any size that might seem desirable. If a work is published embodying the report of Captain Nares and his companions, as there is every reason to suppose will be the case, it is to be hoped that the photographs —or, at any rate, a selection from them—will be included in the volume. It is posible now to print so successfully by mechanical means, in a manner, too, that does not necessitate any wear and tear of the original negative, that the production of copies in this way should not be omitted. In this way, indeed, the country, which has had to bear the expense of the expedition, will at any rate be able to secure something in return for the money spent; and a well written volume thus illustrated would be an ample return to the public for the cost that the expedition has entailed. We shall eagerly look forward, as many of our readers will, too, for the publication of these interesting photographs; and we trust Government will adopt the wise course of having the plates at once reproduced and printed by a permanent process, in a manner which will permit of any one who desires it possessing copies of them.

FITTING-UP AND HANGING PICTURES.*

There is no rule for the width of margin on pictures, but it is usual to give a good broad margin to a valuable work of art, such as water-colours, chromos, proof engravings, and even a good photograph will look well with a good margin. We have seen pictures framed with narrow margins according to the whim of their owners, and it has very much taken away from their appearance when framed. Common pictures, or pictures of but little value, do not require wide margins, and in measuring-up pictures for framing this should be borne in mind. Engravings with india paper are usually measured for a margin beyond, and where there is no India paper the picture is measured for the top and two sides to be equal, and the bottom margin considerably more to allow for the title. The plate mark on the picture sometimes is a guide. Large subjects require broader margins than small ones.

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* Continued from page 508.

Water-colours and chromos can be measured up for equal margin all round, as also photographs if the margin is wide; but should it be narrow, a little deeper margin may be left at bottom.

There is a circumstance which sometimes decides the width of margin at the bottom of the subject, and that is if the picture measures nearly square, it is measured up so as to bring the frame a little longer, as many dislike a square frame.

Fitting Up.—A picture badly fitted up will get discoloured with the air and dust, and will not look so well or last as long as if a little more care and time had been spent upon it. When the frame is made and the picture mounted, it is ready for fitting up, when the glass must be cut, care being taken to select a piece free from defects.

Cutting glass is easily accomplished with a little practice, but some of the foreign is brittle, and will sometimes crack across the pane instead of the cut. The *modus operandi* is as follows:—A large pane is placed on the board covered with green baize, and looked over to see there are no defects, when the frame is measured and the straight-edge is placed on the glass, making due allowance for the room the diamond takes up in cutting. A steady cut is given, holding it between the first and second fingers of the right hand, and keeping it inclined toward the arm. If it is a long cut on a large piece of glass, the best way will be to bring the diamond cut to the edge of the board, and with a steady downward jerk of the piece in hand (if the cut has been perfect), the glass will part evenly. With smaller pieces it will part by holding the glass with the finger and thumb of each hand on each side of the cut, and using a little downward force.

When the pane has been cut the required size it must be well cleaned both sides with whitening, and fastened into the frame by pasting strips of paper and laying them in so that one half lies on the glass and the other on the side of the rabbet. When this is dry, it will be firm, and no dust can get in. The picture is then cut to the required size, attention being given that the margin is right all the way round. As this is a matter of some little difficulty to the amateur, we will just say it can be quickly done by measuring the inside of the frame, and then by putting the rule across the picture you will see how much the margin on the two sides measure, when, by taking one-half and marking it off on the picture, and drawing a line across as a guide for cutting, the margin will be found to be equal. The picture must be measured in the same way for the two other margins. If, on measurement, it should be found to be a little out, a strip cut from the opposite side where the margin is narrow will rectify the error.

If it is a medium-sized picture, a backboard will fasten it in. Backboards can be had of any thickness, from eight to twelve or more cuts in a three-inch plank. The backboard is cut to the required size, and if not wide enough is glued up with a piece of the required size, and when dry it is planed up, and the outside edges bevelled.

Now that the glass is pasted in, the picture cut to the proper size, and the backboard ready, it can be bradded in; but before this is done it will be necessary to see that the glass is quite clean on the inside, that no dust or small particles of wood are between the glass and the picture, and also that the picture is laid in its proper place, when the back can be then laid in. It is advisable to put two or three brads in each side, and then satisfy yourself by inspection that everything is right, or you may have to take out the whole of the brads again to remove a particle of dust or shaving.

The picture must now be backed up with brown paper, or narrow slips pasted round the edge of the back. If it is to be backed up with brown paper, the sheet must be cut the size required, and damped with a wet sponge. The back of the frame must be thinly glued, and the paper at once strained on. This will strengthen the frame, keep the dust out, and perhaps hide a backboard not very smooth. Strips of coloured paper look clean pasted round, when a smooth backboard is in the frame. Where stretchers are used, they are backed up in both ways, according to fancy.

Where very light frames are ordered for large chromos or other pictures, the mitres cannot be made strong enough to sustain the glass and back, and, in inserting the rings in a frame, this can be compensated for in the position the rings are placed. If they are inserted into the top bar of the frame, all four of the mitres take equal share of the weight; if screwed into the two sides, the bottom mitres alone take the weight of the picture; and if screwed into the bottom rail, no strain on any of the mitres is the result, as the bottom rail sustains the whole. This last method is desirable for very light frames, and, when adopted, some light rings must be also screwed into the back of the top bar, through which the cord must be passed and fastened to the rings on the bottom bar of the frame.

In fitting up maple and gold frames, the inside gold must be blocked in tight, and when the gold is ordered under the glass, the glass must first be cut. The stretcher with the mounted picture will be bradded in last, and the back covered with paper. With maple, rosewood, oak, or any French polished frames, it is necessary to clean them down with a reviver before sending them out, as in handling the moulding it becomes dull.

Hanging Pictures.—Our Fine Art exhibitions in the metropolis and large towns of England, together with art unions and education, have improved the taste of the English people in their appreciation of the beautiful. There is now scarcely a cottage where its inmates do not look with pride and pleasure upon some humble effort of art that adorns the walls of their home, and from the artizan to the titled nobility of our land the work of the artist and engraver is admired and valued.

As pictures are so generally appreciated and used as a decoration, it is important that they should be hung properly in order to obtain the largest amount of enjoyment from their inspection. The following hints may not be unacceptable to those seeking information.

In hanging pictures the effect is oftentimes marred by the position and manner in which they are hung, although their owners think themselves perfectly competent to put up their prized works of art so that they shall look well and be appreciated. Our remarks will apply to the elegant rooms of good houses, yet the hints, as far as they can be carried out, will apply to the more humble dwellings of the middle class.

Correct taste has established a custom that oil paintings are hung in dining rooms and halls, water colour drawings and chromos in drawing rooms and boudoirs, and engravings and prints decorate ante-rooms. And while this division is made, it is necessary to observe a selection in each class, as an oil painting by one of the old masters would look bad hung by the side of a recent work of an R.A. In our public exhibitions artists know that their works suffer from being hung by the side of unsuitable companions. Care will also have to be exercised in the selection of drawings or chromos for the drawing room, as the effect of one picture is often spoiled by being hung in close contiguity to another, and subjects should only be chosen of the purest kind, such as landscapes, interiors, sea pieces, fruit or flowers, classical ruins, &c., while no representations of martyrdom, nude figures, or anything of a repulsive nature should be allowed on the walls. All the subjects should create feelings of repose, peace, and purity. We need not mention the desirability of having, if possible, the choicest pictures in good central positions, as well as selecting appropriate subjects in style, frames, and size, for pairs where it is necessary to pair them up.

The effect of different subjects may be mentioned. If life-sized figures are hung, the effect will be to make the room look smaller, consequently these subjects would suit the largest rooms, while interiors and landscapes seem to enlarge a room. Full-length figures or life-sized animals should not be hung with other subjects, as a collection of giants and pigmies fails to give pleasure, and is most incongruous.

Pictures have very often to be hung on walls covered with paper hangings, and the less colour and pattern there is the better. A light pattern gives space, while dark grounds seem to contract the room. Brilliant colours in foliage, fruit, or flowers, are objectionable, and simple neat patterns will be found to harmonize best in a room where it is required to make the pictures effective. The carpet should not be resplendent with all the colours of the rainbow; but a neat dark pattern will heighten the effect of the picture with a seeming augmented light.

In hanging pictures much depends on taste. Some will have the bottom edge of the frames all round a room to range exactly, while others prefer to see the line broken. Due care must also be exercised so that the shadows of a subject are not placed next to a window, as then the side needing most light will not receive it, and a good subject will be spoiled, the owner not knowing why.

It is scarcely necessary to mention that small subjects should be hung down nearer the eye than subjects with larger figures, which can be seen to advantage at a little distance. Pictures hung opposite windows are seldom seen to advantage, as the glass or the varnish reflects the light in an unpleasant manner, hiding the picture from a person standing in front of them. The light in some apartments, too, will suit some subjects better than others, as a full light thrown on a picture will bring out its beauties, while a subject of a different class will be better in a room where less light will be an advantage.

Brass picture rods are usually placed round the top of a room; but in rooms where this is not the case, they are secured by nails, cords, and chains. In some rooms where the pictures are heavy, they are secured by brass plates screwed on to the frame, and then screwed to the wall, and this method is preferable, as no cords or chains are seen. Care is required that nails, cord, chains, and rings are strong enough, as, if either give way, much damage is the result; and it is annoying to come down stairs in the morning and find a heavy frame and picture damaged on the floor, and the remains of broken vases, &c., smashed in its descent. There is to be had gilded wire cord of various thicknesses, that will not stretch like the usual cord employed for the purpose; but even this requires looking to at times, as the friction and strain on a hook or nail weakens the wire.

Where no brass rods are put up, the pictures must be hung on nails or hooks, and these should be well secured. It will sometimes be necessary to plug the wall; but a good hold for a nail is often found at the top of a room. Nails can be had with brass heads, also with heads of white porcelain to screw off and on; with these last care must be taken in driving them, or the bur caused by the blows will hinder the head from screwing on.

The colour of the cord should correspond with the paper or the paint in the room as much as possible, so as not to be noticed, as it is no ornament to see cords on the walls.

If two or three tiers have to be arranged, it is necessary sometimes for the top tier to lean forward to obtain a good view of them. This can easily be accomplished by putting in the rings about one-third of the distance down the sides of the frame, instead of in the top, and the lower the rings are put, the more forward will they hang. This method is sometimes advantageous where glazed pictures have to be placed opposite the light, as it helps to throw off the reflected light from the window opposite.

Where the usual picture cord is used, it should sometimes be looked to, as it is liable to break where it is in contact with the nail and rings, and is constantly getting thinner by stretching from the weight of the picture.

It will be seen from the foregoing remarks that the seemingly simple work of picture hanging requires taste and judgment, and that due care must be exercised to make valuable pictures secure in their positions.

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SOURCES OF DEFECTS IN PHOTOGRAPHY.[*]

If light were the only agency which possessed the power of disturbing the molecules, and commencing that release of the silver from its compounds which the developer is afterwards to complete, the task would be comparatively easy. The photographer would have nothing to do but to take care that the mutual proportion of the length of the exposure and the strength of the developer were accurately observed. But the case is far otherwise. There are a hundred causes which will alter the sensitiveness of portions of the sensitive surface, make the salt of silver either readier or less ready to decompose, and so destroy the regularity of the development. Such difficulties haunt the operator from the very outset of his process. You take a plate of glass, which perhaps to an uninstructed eye appears beautifully smooth, but hold it at a particular angle to the light, and you will detect a faint short scratch. That scratch, if your process is sensitive, will be represented, when the picture is finished, by a bold brown line. If, by ill-luck, it happen to coincide with the position of your sitter's cheek, he will appear in his carte-de-visite, and be handed down to posterity, as Le Balafre, bearing the scar of honourable wounds. If, unfortunately, it should fall a little higher in the face, it will adorn him with the equally combative, but less honourable, decoration of a black eye. By virtue of some obscure chemical law, connected presumably with molecular attraction, jagged edges, or indeed edges of any kind, have a tendency to aid the decomposition of solutions with which they are in contact. Unless the solution is very prone to decompose, the influence is too faint to make itself felt. But it is the peculiarity of photography that it gives expression to the most infinitesimal chemical forces. The influence of the jagged edge in the scratch is quite sufficient to dispose the particles of the salts of silver near it to a quicker reduction than would otherwise have taken place; and where every preparation is used at its maximum strength for the purpose of facilitating a short exposure, that pre-disposition will frequently suffice to produce a complete reduction over the scratches. This is but a sample of the troubles which are entailed upon the photographer by the necessity of guarding against the action of these minute causes of disturbance. After the plate is selected, it must be cleaned; but a clean plate of glass, in photographic language, has a meaning very different from that which window-cleaner or a housemaid would attach to the phrase. A plate may seem to the eye faultlessly bright and transparent, but it may be so dirty as to destroy all chance of obtaining a decent picture with it. Among the numerous causes which promote the decomposition of the salts of silver is the presence of 'organic matter.' A touch of the finger will of course leave organic matter on the plate. If it is cleaned by cloths which have been washed with soap, the same result will follow. If the dust of a room, consisting generally of small hairs from the surface of carpets or clothes, fall upon the plate during any part of the process previous to development, the same risk will be run. In all these cases the chances are, that if the power of the chemicals is strained to produce a rapid process, a stain or spot in the finished picture will record the presence of the contaminating cause.

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[*] *Quarterly Review.*

The difficulties in coating the plate with a surface of sensitive material are equally formidable, and exact equally delicate manipulation. The mode of doing so most commonly pursued is that known as the wet collodion process—which consists of covering the glass with iodized collodion, and then producing a film of iodide of silver by dipping the glass so coated into a bath of nitrate of silver solution. Collodion is a solution of gun-cotton in alcoho and ether. Its valuable property is that, if spread evenly over any surface, its dries rapidly in the form of an exquisitely smooth and slender and yet tough film. At its first invention it was employed exclusively for covering wounds in surgical cases. No particular nicety appears to be required in its manufacture for that purpose; but it is not so with the collodion that is used in photography. The sensitiveness of the silver salts appears to depend largely upon the molecular structure of the substance in which they are held. Accordingly the most elaborate precautions are necessary in making the gun-cotton which in solution constitutes collodion. It is made by steeping cotton in hot nitro-sulphuric acid; but so marvellously minute are the conditions upon which the action of the sun and the developer on the silver salts depends, that the variation of ten degrees in the temperature of the acids in which the cotton is steeped, or a very slight difference in their specific gravity, will make an enormous difference in its capacity, when charged with silver salts, to receive the impression of a ray of light. From this cause, in a great degree, it is that the progress of photography has been so rapid in recent years.

A still more serious trouble to the photographer has been, and still is, the solution of nitrate of silver into which he plunges his plate of iodized collodion, and which is known by the concise name of 'the nitrate bath.' Collodion can be procured from chemists who make it on a large scale, and if properly treated is a tolerably steady and well-conducted material. Extremes of temperature affect it, and it must not be used very new or very old; but with these precautions it generally behaves well and can be relied on. But there is no end to the freaks of a nitrate bath that happens to be capricious. The delicacy of constitution which homœopathy attributes to the human stomach, and which is averred by orthodox physicians to be a dream, is a sober and sad reality in the case of the nitrate bath. Particles of matter so minute that they could hardly be seen except under a microscope are sufficient so to paralyse or pervert its action, that the most skilful photographer cannot, until it is cured, lure it into the production of anything approaching to a picture. For the most rapid kind of work, a perfectly neutral bath is usually employed—neither acid nor alkaline to test-paper. Slight acidity does no harm beyond interfering with rapidity; but the smallest trace of alkali, as much ammonia as would be conveyed by a wet pin, would be enough to destroy the balance, and produce the terrible phenomenon known to photographers as "fogging." The word aptly enough expresses the universal mist overspreading the whole plate, which greets the photographer's eye when, through the fault either of his developer or his sensitive plate, the reducing agency is powerful enough to change not only the portions of the plate which the ray of light has touched, but also those which have not been exposed to it. The presence of alkali, in however small a quantity, predisposes the plate so strongly to reduction, that the developer is no longer confined to the modest position of an auxiliary to the sun, but is enabled to act independently upon its own account. The same dreaded disaster is liable to arise from the presence in the bath of certain kinds of organic matter. The rule does not apply to all sorts of organic matter, nor is it very clear to what kinds it is restrict d; but it is certain that the minutest quantity of some kinds is sufficient to bring a nitrate bath into a condition of more than womanly caprice. If it is afflicted with this malady, there is no limit to the variety of tricks which it will play to its unfortunate employer. One plate will furnish a good picture; the next will be hopelessly fogged; the third will be covered with spots of every shape and size—stars, comets, bars, round transparent holes, or round opaque patches, usually distributed with the malignant ingenuity of a frolicsome elf, so as to show exactly upon the nose of your portrait, or the most prominent object in your landscape. Nor do such freaks exhaust the catalogue of troubles which a contaminated bath can bring on the unfortunate photographer. Fortunately such sorrows are not so common now as they once were. Formerly an unmanageable bath was frequently due to errors in the manufacture of the nitrate of silver. Now the subject is better understood, and a contaminated solution is usually the photographer's own fault. But his bath must still be to every photographer the object of the same tender and unceasing solicitude with which a trapper regards his rifle, or an Arab his horse. It must be preserved from air and from dust; it must be protected during use from extremes of temperature. The exact degree of acidity, or the precise neutrality required, must be constantly tested for and scrupulously maintained. It must be purged from time to time from the alcohol and ether which it is incessantly gathering from the collodion. It must be replenished occasionally with materials of absolute purity, and especially with water that is chemically pure—no easy matter to obtain in a village or country town. It must be preserved in a condition of exact saturation with iodide of silver; for if it either falls short materially, or is in the slightest degree in excess of the precise point of saturation, the result is a plentiful crop of pinholes in the negative, which are represented upon the paper positive by the innumerable dark specks that sometimes give a dirty and fly-blown appearance to the works even of the best photographers. The nitrate bath is the nightmare of the photographer; a kind of evil deity, whose worship he performs with curses, though he cannot forego it for fear of the evil that may befall him. But no efforts to escape from the necessity of using it have yet been entirely successful, though many have been made

After the development is complete, one of the most delicate portions of the process still remains. It is seldom, with the methods that are now employed, that the negative is sufficiently opaque in the high lights to give a satisfactory picture. In order to obtain sufficient contrast the opacity must be increased. This is done either by darkening the colour of the silver deposit with mercury, gold, platinum, palladium, sulphur, or other substances; or by pouring a fresh developer upon the plate mixed with a little fresh solution of nitrate of silver. The nitrate is decomposed, and deposits metallic silver; but the silver in separating is attracted to the silver which is already on the plate, and is deposited in thickness precisely proportionate to the thickness of the silver already deposited in various portions of the plate. The amount of contrast in the resulting picture, and therefore most of its beauty, depends entirely on the length of time for which this operation, known as "intensifying," is continued; and no part of the whole process puts the photographer's judgment and experience to so severe a test. It is a resource of his art of the greatest value, when used temperately; but in the employment of it, as of other indulgences, abstinence appears to be easier than temperance. After the intensification, and sometimes before it, the negative is "fixed;" that is to say, all the salts of silver which have not been reduced by the developer are dissolved and carried away by a wash of hyposulphite of soda, leaving bare glass in the place of the dark shadows. These operations complete the negative.

(*To be continued.*)

ABOUT CARTOGRAPHY (MAPPING).[*]

Amidst the objects exhibited at Philadelphia by the Dutch department will be found the maps of the residences of Java, executed at the Topographic Offices of the Department of War at Hague. At Paris and Vienna they obtained the highest rewards, and it is very probable that they will not leave the New World without having been remarked. Captain Bass, of the staff, gave recently, at the meeting of the Dutch Geographical Society, a very interesting lecture about the manufacture of maps in general, and particularly that of the War Department at Hague, to which that gentleman is attached, and we will try here to give back his description.

The raising of the ground, the measurements, the bringing on paper, as well as the printing of the maps of this most difficult ground, are works whose history is worthy to be known. These maps are the images of long years of struggles of intelligent men on the peaceful ground of science, and the victory has been obtained only by hard work and with great dangers. On the other side are those beautiful sheets, the consequent result of much mental labour, and the application of the last technical improvements obtained through science. They are the final effects of an invention which, if we are not mistaken, will produce quite a revolution and a great simplification in cartography. The inventor, Mr. Eckstein, Technical Director of the Topographical Offices at Hague, makes no secret of his invention; just the contrary, he publishes it with the greatest liberality, with the minutest detail, in a small book, especially intended to be offered to the visitors of the Philadelphia Exhibition.

The maps are printed in colours. In chromo-lithography, as everyone knows, one employs for every shade or tint one separate stone, with the exception of some colours or shades, which can be obtained by the combination of two tints. This is a very dear manipulation, on account of the great quantity of stones wanted, sometimes fourteen or fifteen, and on account of the unavoidable wasted prints and difficulty of printing. Besides that, the light shades are liable to be indistinct. The harmonious combination of the tints depends for the greatest part on the ability of the printer. The process of Mr. Eckstein not only removes these difficulties, but facilitates also the long and dear process of engraving names and outlines. The maps of Java contain no less than two hundred different tints, and these and the letters of the names are all produced with four stones.

The manipulation is as follows:—The stone is first covered, in a very easy way in a dark room, with a solution of nitras argenti, in order to receive the photographic image of the map. The negative of the map is then applied on the stone and exposed to light; afterwards fixed in hyposulphite of soda. Three other lithographic stones are then treated the same way, with the same negative. In this manner you have four maps on four stones, all precisely alike, obtained in the shortest possible time and in the cheapest manner. The stones are now covered with a thin transparent solution of white wax, stearine, and asphalt,[†] and, when this is dry, lines are drawn with a parallel machine by way of a diamond, as near as eight to twenty per millimetre; this is done in both senses of the stones. All the parts which must remain white are now covered with a solution of asphalt in turpentine, and the whole stone surrounded with a border or dyke of wax. Now the stone is covered for half a minute with an acid which has the property to bite the stone only when it has been denuded by the point of the diamond. This acid is composed of nitric acid, water, and alcohol. After having been thoroughly washed with water, the stone is sufficiently engraved for the finest tints. Then, when such fine tints are wanted for the final print, one must preserve these places with a thin coating of lithographic ink, which at the same time makes the cross lines apt to take up the ink. As soon as the ink is dry, the stone is submitted to a second biting of the same acid, but a minute longer, then newly washed. Now one covers those parts which must have this second tint with lithographic ink. In the same manner you prepare the third tint by biting the stone two minutes and a half, the fourth tint four minutes, &c., only with this difference, that by the seventh tint you double the quantity of acid, but reduce the time to half a minute. After having repeated this as often as it is necessary for the map, you wash away all asphalt, wax, and ink with turpentine, and you have one stone ready for one colour, with all its shades. The two other stones are treated the same way. One stone serves for the blue, one for the yellow, the third for red. In this way you can make every possible combination. When, for instance, only one of these colours is wanted in the map (say the blue for water), you cover the same places on the other stones, and leave them unbitten; when the same degree of two different tints cover each other (for instance, blue and yellow), it forms green; is blue a shade darker, it forms blue-green; if yellow predominate, it forms yellowish-green; violet is formed by blue and red, and so on, *ad infinitum*.

The fourth stone is employed for black lines and the names. The black lines of ways, frontiers, &c., are drawn with pen and autographical ink on the stone directly, whereby the photographed image of the map on the stone serves as guide. The letters are brought on the stone by another method, which Mr. Eckstein calls typo-autography. He employs therefore a small press, with which he prints all the names wanted for the map, in every size, type, and curve necessary, and this with autographical ink on thin starched paper, and places these on their respective places upon a print of the blue stone, which serves as guide, and reports them on the black stone by the ordinary lithographic process. He moistens the paper, and so removes it from the stone.

This is, as shortly as possible, the description of Mr. Eckstein's process. Only those can appreciate it who know something of lithography, who know the difficulty of engraving upon stone, its cost, the long time thereto employed, the difficulty to obtain brilliant colours and sharp prints; who have seen the beautiful maps of Java and Switzerland, which are, indeed, gems of execution, and which served as models at the last exhibition of the Geographical Society of Paris; only such persons can conceive the exactness of Mr. Versteeg's words, that the Topographic Office at Hague is the pride of Netherland.

To Remove Varnish from Negatives or Ferrotypes.—A correspondent of the *Philadelphia Photographer* says:—"Use saturated solution of cyanide of potassium one part, alcohol (95°) two parts; flow on and off as in redeveloping; will clear off varnish very rapidly, so the negative or positive can be washed under the faucet, dried, and revarnished, bright and fresh as new. I discovered this method—partly by accident—some months ago, and have used it many times since, always successfully; and, having never heard of any other method as good, I send it for others to try. I have at various times tried most of the published methods for removing varnish from collodion films; instance, pure alcohol bath, ammonia and alcohol, common crude potash and alcohol, vapours of hot alcohol, &c., all more or less available: but in my experience all more tedious, more expensive, or more dangerous to such films than this method. Whether the cyanogen aids the solvent action of the potash or not, the materials for this combination are ready in almost every gallery, and seem perfectly reliable in action. Of course it must not be used on negatives strengthened with bichloride, or similar chemicals, especially soluble in cyanide."

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[*] Translated from the *Algemeen Handelsblad*, in *Philadelphia Photographer*.

[†] Probably dissolved in ether or benzine.—(Note of the Translator).

The Photographic News.

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ARTISTICALLY FINISHED ENLARGEMENTS.

We have been favoured by Mr. Faulkner with some examples of photographic art studies which he is preparing for publication. They consist of enlargements from small negatives of beautiful children artistically treated. The two first of the series, which are before us, are two different studies of "Little Dorothy," whose portraits, in the style of Sir Joshua Reynolds, those of our readers who visited last year's exhibition are familar with. The pretty innocent looking face, the quaint light draperies, the old-fashioned mob-cap, and the treatment generally, combine to produce most charming pictures. The size of the prints is about twelve by ten; they are printed in carbon of a tone resembling the old mezzotint engraving, or, perhaps, a little more inclining to sepia tint. Each print is mounted with broad margin, a deep india-tint surrounding the picture.

In these pictures Mr. Faulkner somewhat boldly tries conclusions with the older art of engraving, essaying to produce pictures by photography which shall compete in all respects with works in which the artist's hand alone shall embody his conceptions. At the same time he avows his conviction that photographs as usually produced are not works of fine art. He informs us that his aim is to imitate as closely as he can, by photographic means, the effect of mezzotint engravings, avoiding most carefully those essentially photographic qualities regarded as so precious by many photographers, and praised as "sharpness," "brightness," "clearness," &c., feeling assured, as he asserts, that no pictorial attempt can be regarded as a true work of art, or a faithful imitation of nature, where these qualities are sought after as of primary importance. The pictorial result produced will, we doubt not, please all persons of cultivated taste and art instincts; although we can conceive that some persons, outside photography, may be disposed to ask for more brilliancy. For it is to be noted that there is in the present day a large section of the public whose pictorial tastes and ideas have been chiefly educated on photographs, who regard a perfect albumenized print, from a very sharp brilliant negative, as the perfection of art, so far, at least, as monochrome is concerned; and these regard extreme sharpness, great contrasts, and what they regard as brilliancy, as qualities of all importance.

Mr. Faulkner has sought to avoid this, and the somewhat novel mode in which the pictures are produced lends itself to the especial and charming softness and harmony of tone which he has secured. The negatives are produced from very carefully finished transparencies, and on this fact much of the novelty and softness of effect depend. The great range of control which the powder carbon process gives to an artistic manipulator is now pretty well understood by photographers. In applying the powder to bring out the image, the management of light and shade, the production of depth and intensity, or delicacy and tenderness, are largely in the hands of the manipulator. Such transparencies produced with skill and judgment, and the art qualities further secured or supplemented by judicious retouching on the transparency, which is then used for producing a negative, afford facilities for securing fine pictorial results requiring no further retouching, and in every way fit for publication. The prints produced in carbon from such negatives are developed on drawing-paper the tone and texture of which still further bring the prints out of the category of ordinary photographs. The result is, as we have said, in every way satisfactory. A charming subject is admirably treated, and the production, at every stage, is treated with consummate photographic skill and fine perception of artistic requirements. Mr. Faulkner contemplates, we believe, issuing some printed in the soft low tone of red which was employed in the Bartollozzi prints, which had considerable vogue about the close of the last century. These are very effective, and will please the taste of many.

HINTS ON CHARACTER IN PORTRAITURE.

We promised in our last to return to the subject of securing character and expression in portraiture. We have moreover received several letters referring to some of the remarks in our last week's article on the subject, which require brief notice. To the letter of one correspondent, eminent in portraiture, warmly approving of our comments, we need not advert fully here, beyond quoting one of his observations. He says: "To secure a portrait of a man in his completeness, mind and body, instead of a mere mask of his physical presentment, I consider the highest achievement in portraiture, the highest aim of the most skilful portrait painter, the crowning glory of a photographer." A correspondent signing "A Portraitist of Thirty Years' Standing" asks the question how photography, with time devoted to the study of character, is to pay; and "An Operator," whose duty is to take on an average thirty sitters a day, asks where the time is to be obtained in which each sitter is to be studied.

There are, it must be admitted, many important phases of the question to be considered, and a most amusing communication, suggesting curious reflections bearing on the question, has recently come into our hands, forwarded by one of the most experienced and able of photographic portraitists, as an example of the requests which are occasionally made by ill-informed but self-sufficient patrons. The letter, which he recently received, runs as follows:

"Sir,—Be so good as to make an appointment for my children to be taken—carte-de-visite—separately; or together I should prefer, if you think it can be done successfully. I very much object to children (or anyone) especially being posed in constrained, affected, unnatural positions, as is almost always done, more or less, by photographers, and wish them to be taken perfectly naturally, in the attitudes in which they naturally stand, or rather, I should say, in no attitude whatever. What I want is a likeness of the children, whose characteristic positions a stranger cannot possibly know, and who should be therefore left to themselves. One main essential to an effective and lively likeness, is to take them instantly, before they have time to get tired or to get artificial or self-conscious."

This is, in some respects, a type of the verbal requests with which photographers are perpetually beset. The conceited grown-up sitter will assume some awkward or affected attitude, on the plea that he desires to be "natural." Parents will piteously ask, regarding the portrait of a restless child, "Cannot you take him when he does not know, whilst he is playing about the room?" At times it is possible to pleasantly ignore such suggestions, at times it is not difficult to make satisfactory explanations, and occasionally it becomes necessary to get rid of such customers altogether.

"I don't care a fig for your notions of a good portrait—I pay you to take me as I wish," said an impertinent, fast young fellow to a portraitist once, as he sprawled over a seat, holding a meerschaum in his mouth. "Sir," responded the exasperated photographer, "your guinea is of infinitely less importance to me than the character of my work, and I wish you good morning."

The answer afforded to the above letter was much to the same effect, almost as brief, more polite, and nearly as decisive. It ran as follows:—

"Sir,—I shall have great pleasure in trying to take portraits of your children, but to comply with your instructions is quite impossible, and it would be absurd of me to undertake to make portraits of children under your conditions. It would be only waste of time and material. I have been a photographer for upwards of twenty years, have taken every honour that has been open to photographers, and my work has been chiefly with children. If you will allow me to make the best photographs a photographer can take of children, I will try to take yours. I do not make an appointment, as you probably may not care about having them taken except in your own way."

We need not comment upon this letter in reply, beyond remarking that whilst it is courteous, it is the only reply which could be made to an insolent letter, which begins by telling a photographer that "constrained, affected, unnatural positions" are usually produced by the art which he practises. Turning from this singular example of the experiences of a portraitist, let us glance for a moment at the letter of a "Portraitist of Thirty Years' Standing," and that of "An Operator." There is little to say in answer to the question of the latter. If his duty involve the production of portraits of thirty sitters daily, he certainly cannot devote much time to the study of character and its embdioment in his work. Nevertheless, if he work with an intelligent aim to produce characteristic portraits, rapidity in operation will prove rather an aid than a hindrance. Slow, uncertain, fidgetty operators often manipulate a sitter so tediously that all expression but weariness is destroyed. It is the habit of rapid observation of characteristic features, movement, and position to which we referred as of vital importance, and this may be successfully applied, at least in degree, in the most wholesale manufacture of negatives. The same answer is applicable to a "Portraitist of Thirty Years' Standing." Primarily we might say that it generally pays best to do work well. A reputation for exceptional excellence will generally secure a *clientelle* willing to pay exceptional prices. But whilst we do not ignore the commercial element, yet, in urging forms of art excellence, it is less our purpose to prove that a thing will pay than to show that it is good and desirable, as securing the elevation of art and the artist.

It must be admitted at the outset that the photographer is bounded by much more limited and arbitrary conditions than the painter. All that he can perceive of character and expression, all that can be educed in conversation, every passing glimpse of emotion, every phase of thought, giving its momentary light to the features, may, by the great master of his art, be generalized to produce a living face capable of and accustomed to these thoughts and feelings. Tennyson describes such a process—

> "As when a painter, poring on a face
> Divinely, through all hindrance, finds the man
> Behind it, and so paints him that his face
> Lives for his children ever at its best
> And fullest."

There are such portraits of men and women, nameless and unknown, except for their portraits. The picture in the English National Gallery, catalogued as "Gervartius," of whom nothing is known except that it was painted by Vandyke, is so truly a living face, not a mere mask; so thoroughly a presentment of a man, so thoroughly linked to humanity with its thoughts and feelings, joys and sorrows, that few pictures are studied with a fuller and more enduring interest. So with the portraits by many other of the great masters—Titian, Velasquez, Rembraudt, Holbein, and, in later days, Sir Joshua, Gainsborough, and others. In many of their portraits, the interest is not in the subject, which may be plain, or in the character, which may be unknown, but in the artist's work. And, within limits, it is within the power of the photographer to produce similar results. Such portraits—with limitations, it must be admitted—but such portraits, in kind, if not in degree, have been produced by photography. Who that has seen Rejlander's work has failed to see, in many a common place portrait, an individuality and character which arrested the attention from its look of living reality? We have complained of the dead level of good quality of the mass of the portraiture in the present exhibition, but there are a few exceptions, which those interested in the subject may think it worth while to search for amid the mass of that quality which Ruskin designates as "patience and sand paper," and which he has assured us will not make a picture.

The practical hints we intended to write in this article must stand over until next week, when we shall describe the modes of working of some typical portraitists.

THE ZINCOGRAPHIC PROCESS.*

After the "deep-etching," the plate, on examination, should show the lines black and brilliant. No portions of the image should appear to run together nor fail. The back of the plate must not have been injured, nor betray scratches or lines. If it does, it must be coated with a solution of asphalte. When the plate is put into the stronger acid solution for "deep-etching," the colour changes more rapidly, which proves that a more energetic etching action is taking place.

After the operations have been controlled in the manner described, and the plate examined after every washing and etching operation, and it is found that the relief has attained the height of a thin cardboard, the plate is again dried in the flame and rubbed with the phosphoric acid and gum solution, and then put ready again for the application of the ink roller.

In the meantime there is mixed upon the lithographic stone a little litho. ink with about one-tenth the quantity of tallow, and of this a portion is applied to the roller. The latter, after being well worked on the slab, is then applied to the plate and the ink vigorously rubbed upon the image until the latter is thoroughly coated, an operation that is soon performed, as the tallow renders the ink very suitable for the purpose.

The plate is again put upon the network, and mildly warmed, but not heated. When it has become warm and is quite dry, there is put upon it by means of a spatula a small quantity of powdered resin, which is rubbed over with a tuft of cotton wool. This dust rapidly attaches itself to the inked image, and afterwards the excess of powder is accurately removed, and the plate again put upon the net-work and warmed. It remains in this position upon the stand until the uniform warmth underneath has gradually fused the ink and the resin into one mass, and the mixture has flowed over the lines, covering the finer portions. If you have several plates to etch, one may be allowed to cool while you are treating another.

Into the etching liquid is now poured a mixture of equal parts of nitric and hydrochloric acid (aqua regia) until the strength of the liquid attains from 20° to 25° Beaumé. In this liquid the plate is permitted to remain until the etching has proceeded to the depth of a millimetre. The frequent withdrawal of the plate from the liquid and washing of it, and, in fact, the repetition of any of the cautionary manipulations already described, cannot be enough recommended.

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* Continued from page 495.

When the etched plate has been produced to the depth of a millimetre, the plate is dried over the flame, and the lines are coated with solution of asphalte by means of a brush to which one of its weight of litho varnish has been added, so that it is easily manipulated with a brush. The coating of the lines with asphalte varnish must be thoroughly done, the image being covered to a depth of at least two millimetres.

This asphalte and varnish mixture allows the resin dust to attach itself very liberally, even when but slightly warmed, and forms subsequently an indestructible protection for the image that lies underneath. The saturated etching fluid is now thrown away, and water put into the vessel to the height of two centimetres; some gum solution is then added, and aqua-regia to the extent of a third of the water. The plate is put into this, and the etching continued while the bath is gently tilted to and fro; the action is from time to time examined and controlled, until the requisite depth has been secured.

If on making a control experiment it is seen that a portion of a line is becoming injured, and is uncovered, the plate must be dried and warmed once more, covered with asphalte solution and with resin dust, the latter being afterwards fused into one mass. The "deep etching" should at the longest last an hour. After the etching is finished, the plate is immersed in oil of turpentine, and then freed by means of a brush of all fatty adherent matter, a solution of caustic soda being finally employed to remove the last traces.

The plate, finished thus far, has not a satisfactory appearance. Although a good printer is in position to secure the best impressions from such a plate, the unskilled operator would not succeed in obtaining anything worth looking at. The reason of this lies in the sharp margins which surround the high lines, and which, if the plate is laid upon a soft basis, yield double lines in printing, and bring about other defects. These sharp images may be rendered innocuous in the following manner.

The Finishing or Post-etching of the Plate.—The plate in its present cleaned condition is examined against the light by means of a level to see if it is even. The roller, which has been perfectly cleaned in the meanwhile (or it is better still to employ another), is treated with ink with no tallow, which is rubbed upon a stone slab. When the roller has been well coated with the ink, it is passed over the image very lightly, until all the lines have been well covered with ink. On the margins, however, no trace of colour should adhere, and, if this is the case, the plate must be cleaned once more. Generally speaking, it is the roller that is at fault, upon which either the ink has been badly applied, so that lumps of the same lie upon the surface of the leather, or the roller is too soft and uneven.

The well-inked plate is again warmed (not made hot, it must be borne in mind), and dusted with fine resin powder; it is then very carefully indeed freed from the superfluous powder, and again warmed until all the lines appear black. Asphalte and turpentine solution is applied to the back and margins of the plate with a bristle brush, and permitted to dry. Some more etching liquid is prepared, and gum solution added, together with acid, to make it up to 5° Beaumé strength. Into this solution the plate is put, and allowed to remain until you begin to see that the sharp marginal lines begin to become rounded. The plate is then dried, and a little ink, mixed with tallow, is applied by means of a litho roller; powdered resin is dusted upon the plate, and the same fused by warmth with the greatest care, so that it only just melts, and does not flow to the margins.

Again is the plate put into the etching bath to be thoroughly etched, and then inked and warmed again until the margins appear beautifully rounded, and the relief appears finely graduated. Properly trimmed, the large whites being cut out with a saw, and put upon wood on the same level with type, and we have a block that may be worked in a printing press.

Those who work according to this well-tested method must be prepared to encounter many difficulties, but these he may safely put down to his want of experience and he may safely rely upon it that, when he has acquired sufficient practice, he will be successful, for in this, as in other methods, no one can obtain good results till he has acquired skill and knowledge of his work.

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THE ARTISTIC USE OF BACKGROUNDS.

At the recent Convention of the National Photographic Association of America, Mr. L. W. Seavey read a paper on the Use of Backgrounds in Aiding Pictorial Effect in Photographs, illustrating his remarks by figures roughly drawn on cartoon paper. We condense from our Philadelphia contemporary some portions of his paper. After some preliminary observations he said:—

"Every background is painted for some particular kind of picture, or to produce some particular effect. Shadows are placed here, and lights there, that when you place your subject before it the features and drapery will be so relieved that the figure will seem to stand forth from the background. Great pains is taken that lines may not intersect those of the figure at points that will produce unpleasant angles.

"I remember that when I first began to pay attention to painting, I used chiefly pure colours, and not long ago I was reminded of my former method by hearing an artist say that the same was true of all amateurs; hence their pictures are usually crude, and delicate only after they have had experience. They subdue their colours, and mix them with white, making them more neutral; the result of it is, that when you examine a good oil painting or a water colour, you hardly see traces of the pure colours of the palette. The tints are almost indescribable. You don't know exactly how they are made. After you have had experience in handling these colours you can then perhaps solve the problem.

"I remember in my early experience looking through a camera at a sitter; I could not see where the shadows were that afterwards developed themselves on the plate, and I have no doubt that many young photographers, in posing their subjects, put them in certain positions because they know a certain effect will be produced, although they are not able to see in the camera the shadows just mentioned. Now a painter learns to arrange lines and shadows by drawing figures, landscapes, and architecture; and were the photographer to draw his figures, he would realize the necessity of a good arrangement of light, shade, and the principal lines. As photographers, you can scarcely appreciate that, I am afraid. I know that in painting theatrical scenery, in order to make one object stand prominently forward as the subject of the picture, we have to put either a broad shadow behind it, and put the figure in light against the broad shadow, or reverse the process. Doré's pictures, if you examine them closely, reveal that they are very simply constructed, so far as light and shade is concerned. In one of the scriptural subjects that I have seen, the figures are placed on elevated ground in shadow against a light sky.

"Another thing that probably applies to photography as much as to painting, is that the artist's character is impressed indelibly on his work. If he is a refined, intelligent, and cultivated man, you will see it in his pictures. If, on the contrary, he is gross, boorish, uncultivated, you will see that. If he is an awkward man, you will see the same in his pictures. He will pose his subjects as he feels himself, and according to his understanding. Notwithstanding his subjects may be awkward, if he is an intelligent and a refined man, if he has a high idea, it will still be manifested in the posing. We see that more particularly in painting. A man who is a rough, coarse man, will produce pictures which will be stiff and angular. He will use dark browns, sombre greens, strong colours, and he will paint more with the pure colours from the palette than from tints produced therefrom.

"I am acquainted with quite a number of scenic artists in New York, and I have taken a great deal of pleasure in noticing the similarity of their paintings to the character of the men themselves. Now, in photography, I have noticed in the exhibition down here that there are some pictures that are what we would call weak—there is a large amount of light in them, a rambling arrangement of accessories, no broad shadows, and no grand effect or high ideal. If a man is weak in his character, if he is insipid in his conversation, you will see it in his paintings or in his photographs. If he is energetic and full of *vim*, you will see that in the posing of his figures. I hardly need mention names, but to illustrate, probably, the extreme of energy as manifested in photography, I may mention one of our highest lights in the profession, Mr. Sarony, of New York; and there are other photographers possessing a great deal of refinement, and you will see it manifested in their photographs.

"Engravings and copies of paintings can well be studied, and probably understood and better appreciated by photographers than the paintings themselves, because you deal solely in light and shade. As you do not deal in colour, you are consequently more or less colour-blind; but when the tints in a painting are translated (as I may say) into black and white by engraving, it is then akin to your own work, and you understand it more readily. Our illustrated papers are now publishing engravings of some of the most important figure-paintings of the day, and their low price brings them within the reach of all who have a desire for improvement.

"Photographers should surround themselves in the gallery and at home by works of art, not alone by pictures, but by bronzes, plaster, or other casts, according to their means. You don't need necessarily to invest large amounts of money in these, in order to get beautiful forms, because there are many inexpensive productions which you can use to ornament your home and gallery. Their effect will be to refine and elevate, and your work will partake of the higher character of these surroundings. If you surround yourselves with rude forms, rude statuary, such as the sculpture of Yucatan and South America of thousands of years ago, they will probably drag you down. But as you surround yourselves with fine forms, fine pictures, and with works that are above you, you are sure to be elevated by them. You will find that they adorn the walls of your reception-room and skylight, and your customer will feel when he enters that he is surrounded by a new influence, that he is in the realm of art, where the beautiful is made a study.

"I will now make a few sketches illustrating some of the ideas I have in my mind when I am painting a background for you. The first one will be that of a comparatively plain background for a standing figure. We will suppose this to represent a figure of a gentlemen. Now, the figure, as you see, stands independently and alone on the background; it has nothing to support it. Now, if the background is made lighter at the top and darker at the bottom, the interest then, instead of being distributed through the whole length of the figure, will be directed towards the head, and the lower part of the figure will be scarcely noticeable. The shadows will, in a measure, blend into the lower part of the background. When you look at it, the first thing you will notice will be the face, as that really should be the most noticeable part.

"One of the most difficult things in photography is to pose a full-length figure; but it is still more difficult to pose it without the aid of auxiliaries of any kind. It requires a knowledge of anatomy and composition which even schools of drawing have difficulty in giving. Now, suppose that you are posing a full-length figure, you will not make it a square front view; of course, with us this is gone by, except on rare occasions. And the purpose of an object on the background in this case would be by having it dark at the bottom to still keep the interest at the top, and divert the attention from the lower part of the figure.

"It is well always with full-length figures to convey the idea that the figure is doing something, looking towards something, reading, or examining the surroundings. I think it best not to let the horizon line cross the figure at too high a point.

"I will now give illustrations of the tendency of lines. The first will be that of a picture I saw in the Russian collection yesterday. This was, I think, a very curious one, and the spectator's eyes were unconsciously directed to the hands of the subject instead of to the face. The lines all come to one point, those of the drapery and those of the accessories all centreing in the hands.

"Here is a position that you have seen probably many times; it is a simple figure of a lady leaning with her elbow on a table. The light runs down the arm, returns along the forearm and hands to the face, and the light being the strongest there, even if you look at the shoulders first, your eye is led involuntarily to the face.

"It is always best to indicate a point from which the light comes. Thus, a light placed in the background as a complementary light to the one on the face should not be of the same strength. The principal light should always, or nearly always, be the one on the face, and I say to those using my backgrounds, in case the light in them happens to be too strong you can very easily subdue it, and graduate it, so as to produce the desired effect by the use of ordinary charcoal such as crayon artists use, and in case too great a change has been produced you can dust off the superfluous charcoal with a hankerchief. I mention this, because yesterday a gentleman said he had a background in which the light on the wall was too strong, and he did not know what to do with it.

"Now, as to some of the errors I have noticed in using backgrounds. Here is one you may see in the Russian department of Photographic Hall—a landscape—and the subject has been so placed that a tree appears to be coming right out of the top of the head!

"Here is one in the American department in which you have what may be called the pyramidal composition! This figure gives the effect of the peak of a mountain in the background springing out of a lady's head.

"I have an incident to tell you, which, I think, has never been told. Some two years ago I received a letter from a stock-house in Philadelphia ordering a landscape sea view background, one which we designate as the Evangeline, which some of you know; also for a rustic arbor and fence. Quite a little bill! The photographer had been successful, and thought he would invest some money in backgrounds and accessories. The order was filled at my establishment, and being shipped to the stockdealer we did not know who finally received it. About a month afterwards I was making a short tour through the country, calling on my photographic friends for the purpose of drumming up business. I was very much surprised one day, on entering a gallery, at seeing a background which in colour made me think it had been executed either by myself or by one of my artists; but the design was something new to me; I had never seen anything like it before. The rustic arbor and fence I recognized at once. After a moment I comprehended the matter. The photographer had, in mounting the background, turned it so that the horizon line was vertical; he afterwards told me he could not tell which end should be up, so in his dilemma he called in his friends and they had a regular consultation, and, finally, concluded that a point of land extending into the water was a church steeple, and, therefore, it should be placed in the way in which I found it. I have frequently seen the old-fashioned baseboards in front of landscape backgrounds; they should never be used with even plain or interior backgrounds. I hardly need mention this to you, for I am sure those present never much such mistakes. If possible, the junction of the background and floor should be hidden, either by shadows or by placing an accessory to hide the line. The foregoing is essential in order that the picture may have a realistic appearance.

"Occasionally a customer, on seeing a proof, complains that the hair sticks out, or something else sticks up, and you reply that you do not arrange hair and bows. I claim that it is the duty of every photographer to look at the personal adornments of the subject, and arrange them with the same degree of care that an artist in a studio does in posing his model for a picture which he desires to paint.

"Occasionally I receive letters finding fault with my backgrounds—that they are not dark enough in the shadows, or that they are too light; and I have occasionally sent for proofs; and, in several instances, where the complaint had been that they were too light, have found the photographer had been using the background turned somewhat towards the side-light. We have great difficulty in painting backgrounds to make the shadows as intense as they are in nature. It is really impossible. As the photographic value depends upon the relative degree of light and shade in the background, it should be placed at right angles to the side light, or with the side-wall of the room.

"Mr. Whitney asked what style of background Mr. Seavey would recommend for head and busts, who replied: 'I think, for those purposes there should be no design in a background, except of a simple arrangement of light and shade. For bust work it should be darkest at the bottom, growing gradually lighter towards the top. I think, in bust pictures, the background should be so retiring that the spectator will not notice that a background has been used.'"

WHY THE CARBON PROCESS IS NOT MORE GENERALLY ADOPTED?

BY W. F. GELDMACHER, OF FRANKFORT.*

The question that has been put so frequently of late, Why is not the carbon process more generally adopted? has troubled me a good deal, and I have come to the conclusion that it is not only the elaborate manipulations requisite, which stand in the way of the universal introduction in the process, in the double transfer, &c., but that the matter of expense has also considerable influence in the matter. In my humble opinion the production of a carbon picture comes to just double as much as a silver print of the same size, and this only provided the printer is well acquainted with carbon printing, and does not waste too much material.

The main reason, I believe, why this beautiful and interesting process does not make way is because of the difficulty photographers have in getting out of their old habits; they cannot tear themselves from the manipulations they have been used to perform for many years past. It is only when they cannot well do otherwise, when they are carried on with the times, and when hanging back any longer would have the effect of seriously injuring their business, that they at last consent to make a step in advance. And even then they do not take the initiative without severe grumbling on account of being disturbed from their quiet jog-trot work. At the same time, the day is not far distant when the public, even the uneducated portion of it, will recognize the value of the new process, and the permanence of pigment pictures. In my studio I have already received many specific applications from customers for carbon prints and nothing else.

Many photographers who never will have to do with novelties have made statements which, if they were true, would do much to banish carbon prints from the studio. They tell us that the tone and richness such as silver prints possess, is not to be attained by printing in pigments. I have energetically repelled this idea, which is based only on old customs; for not only I, but many of my esteemed colleagues are at the present moment in a position to produce carbon pictures which are in nowise inferior to the silver prints prepared from the same negative. The delicate tints in pigment printing exceed, indeed, those of the silver prints. And we are not yet arrived at maturity in the new mode of printing, and many may remember the long time that elapsed before the production of fine and successful albumenized pictures was assured. It will be the same with pigment printing; as time goes on we shall improve our materials and our manipulations, and thus work far more securely and quickly than at present. Neither should we forget that the apparently elaborate and tedious double transfer process does not yield us pictures similar to those produced by the ordinary silver printing, but gives enamelled pictures at once as beautiful as any of those which can be produced by the glazing method, involving the employment of gelatine and collodion. I would undertake to say, in this respect, that enamelled pictures are not to be so rapidly produced by the silver process as I can prepare them by the double transfer carbon method. As a substitute for such enamelled silver prints, these carbon pictures are in every respect to be recommended, and as such prints are produced at a higher price, they do not involve more expense by one method than the other, while the greater permanence of the carbon impression is an advantage that has no counter weight in the silver print.

At the same time, I would not go so far as to say that we do not need the single transfer process. Indeed, so far as I am myself concerned, I have been working for some time to simplify the single transfer process, so that I may adopt it permanently in my establishment, for all customers do not order enamel pictures, nor—and this is the most important—do all want to pay the price of them. It has been suggested to expose the film in the camera through a glass plate, so as to secure negatives in the sense adapted to single transfer work. This is a simple way, no doubt, of overcoming the difficulty, but I cannot bring myself to adopt it. From such a cliché it is then possible only to produce pictures by single transfer, and enamelled productions by the double transfer process would not come out in their proper sense. In order to then get enamelled pictures, it would be requisite to treat the prints in the same way as you are wont to do with albumenized pictures. The proposition to cover the pictures with a film of varnish I do not like at all, for it is impossible by such means to obtain the transparency and gloss imparted by collodion. Neither can carbon prints be treated under a roller press. I would rather follow the principle to obtain negatives which can be printed by single transfer as well as the double transfer process, and which always yield impressions in the right sense. This principle could be secured by stripping the film from the negative plates with gelatine. Such an operation is, however, a tedious and lengthy one, and in damp weather it may happen that two or three days will elapse before such films can be used in the printing frame. We should not, therefore, gain in the end, for what time we saved in the printing would be lost in removing the negative film from the glass plate.

For some time past I have been engaged upon some experiments, with a view to securing the negative upon an elastic film, which is thin enough on the one hand to permit of its being printed from one side or the other, and which, in a wet or dry condition, is easily separated from a glass plate. I hope to make public my process very shortly, and it will be found, I think, a much more simple and easy method than the ordinary silver process, while the saving of time effected will, I have no doubt, compensate for any increase involved in the cost of materials. We shall then have got as far on our way as to be able to say that the carbon process supplies with quite as beautiful results, and is, at the same time, more rapid and more certain to work, than the silver process, and former antagonists will promise their support to attain the highest state of perfection. So far as I am concerned, I must admit that I have found the new process much more interesting than the former one, for, beyond the ordinary production of photographs upon paper and glass, it opens up to us a whole series of beautiful applications. It permits of the transfer of images to surfaces which it was very difficult or impossible to cover with the photographic prints by the silver process. I manage to transfer carbon prints to all sorts of materials—to ivory, enamel, porcelain, marble, silk, atlas, leather, linen, canvas, oil-cloth, mother-of-pearl, wood, horn, &c.—and upon every surface covered with pigment, and every metal. Especially upon gold and silver my impressions have been very successful. For ornaments, antiquities, and the like, is this transfer process of exceeding worth, and many rare objects from celebrated collections have been handed over to me to copy in this way.

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* *Photographische Correspondenz.*

Lately, too, I have made a few trials with carbon tissue in the solar camera, and have, so far, obtained some very satisfactory results. I proceed in the manner following:—The little original negative is exposed in the printing frame with the aid of a photometer that I have constructed for my purpose, and I observed the degree necessary to print it sufficiently. I then put the cliché into my solar camera, and focus it. After my tissue has been set up there remains a strongly-lighted margin produced by the transparent glass around; so I cover this part of the tissue with a strip of sensitized albumenized paper, and allow the light to act until this paper has taken up the same tone which my photometer previously showed sufficed for the printing of the negative. In this way I never fail to give the proper exposure, and obtain a well-printed, enlarged copy of my cliché. Of my further progress I hope to speak at some future time.

Talk in the Studio.

South London Photographic Society.—The next meeting of this Society, being that of the "Annual Technical Exhibition," will take place on Thursday next, Nov. 9th, at seven o'clock, in the large room of the Society of Arts, Adelphi; admission free. To meet the wishes of many who attend the technical exhibition, and who have desired to join the members on such an occasion, the annual dinner has been fixed for Saturday, Nov. 11, at Anderton's Hotel, Fleet Street, at 5·30 o'clock. Particulars can be obtained from the Hon. Sec., Mr. Edwin Cocking, 57, Queen's Road, Peckham.

Conversazione of the West Riding Society.—The West Riding of Yorkshire Photographic Society contemplate holding a conversazione on Wednesday, the 22nd instant, at which music, recitations, &c., will form part of the entertainment. We hope it will be a success.

Alleged Embezzlement.—The *Hertfordshire Express* reports the hearing of a charge of embezzlement against the assistant of Mr. Nichols, photographer, of Hitchin. The accused, it seemed, travelled about to take negatives for his employer, sending them home to print, and coming home every Saturday evening to account for orders and cash, which amounted at times to £10 a week. Prisoner had failed to account for all the money received. His defence was that he kept it back to recoup himself for money owing to him by his employer. He was committed for trial, and bail taken for his appearance.

Photographic Swindling.—The *South London Press* gives the following on the authority of a provincial paper—: "A firm of photographers, giving their address at Brixton, South London, have been visiting Ashwell, and other places in this vicinity, and obtaining money under pretence of photographing houses, &c. They obtain permission of one of the principal shopkeepers to photograph his premises, and then, with this as a recommendation, solicit other orders, taking the cash in advance, with a promise of sending on copies as soon as they can be printed. Of course nothing comes, and the expectant houseowners have to content themselves with the substance without the shadow. This is a very old trick. A neater version was tried some time ago by a clever professor of the black art, and for a time succeeded admirably. His plan was to take the negative, and print as many copies as were required, and, having obtained his money, to decamp as quickly as possible. At first sight it would appear that the customer was not swindled; but the fact was, the prints were delivered just as they came from the printing frame, without the long and laborious process of toning, fixing, and washing, and, of course, on exposure to light, they rapidly blackened. The advantage of this method is that the law does not reach the perpetrator so easily as it does in the first named." [Surely it was scarcely worth while, to save an operation of little cost, for the most fraudulent trickster to do this. Fixing imperfectly and washing carelessly are so common that they have almost grown respectable; but not fixing at all, surely this is too much!—Ed. P. N.]

Lord Brougham's Daguerreotype.—In a recently published volume by Miss Martineau, she gives the following anecdote and comments:—"Lord Brougham was at his chateau at Cannes, when the first introduction of the Daguerreotype process took place there; and an accomplished neighbour proposed to take a view of the chateau, with a group of guests on the balcony. The artist explained the necessity of perfect immobility. He only asked that his Lordship and friends would keep perfectly still 'for five seconds;' and his Lordship vehemently promised that he would not stir. He moved a little too soon, however, and the consequence was a blur where Lord Brougham should be; and so stands the Daguerreotype view to this hour. There is something mournfully typical in this. In the picture of our century, as taken from the life by history, this very man should have been a central figure; but now, arising from his want of steadfastness, there will be for ever—a blur where Brougham should have been." [This is surely unfair. Few people will believe that Brougham, whose figure is so intimately and grandly associated with the abolition of slavery, with great law reform, and, in fact, with almost all the progress of his time, will only remain as a blur in the history of the nineteenth century.—Ed. P. N.]

Photographic Queries.—*(By one who would like to know, you know)*.—When a photographer produces a bad "carbon portrait," does his sitter call him over the *char-coals*?—Every photographer knows Io-dide of potassium; but, pray, who supplied her with the deadly chemical?—Do photographers' *passée* wives avail themselves of the "*enamel* process?"—Has an ambitious photographer ever attained to the full-*film*-ent of his dreams?—If you put it in the "dark room," does it make the camera *obscura* than before?—When a photographer should do well and doesn't, may one conclude that he knows nothing of the "*ought-to*-type process?"—Is respectable Collodi-"*on*" except when the occasion is especially festive?—Do reserved photographers always go about in "masks?"—If a male sitter, by judicious "posing," is made in a photograph to look *im*-posing, does not a female sitter, under like conditions, look *her*-posing?—Do any but very opulent photographers perform their ablutions in a "*silver* bath?"—Doesn't a gentlemanly photographer find it difficult to abstain from hurting the feelings of his "*sensitive* paper?"—Has Dr. Darwin ever seriously studied the development of—"negatives?"—Do those intelligent photographers who regularly read the best comic paper ever *Funny* "*Folk-*"*us* their clients?—By "dodging a negative," does a photographer ever succeed in getting an affirmative?—Isn't it very convenient for bachelor photographers to always have a "dry plate" about when they want their dinners?—*Funny Folks.*

The Universal Distribution of Chromium.—With regard to the new mineral daubrotite, which has lately been observed in meteoric masses, Professor J. Lawrence Smith considers it to be protosulphide of chromium, of the composition—sulphur 37·62, chromium 62·38. This, taken into consideration with the revelations of the spectroscope regarding the vapours which surround the sun, shows that chromium is largely diffused through the material of the universe.—*Scientific American.*

Replacing a Broken Negative.—A correspondent of the *Philadelphia Photographer* writes:—"A copy from an old card, raised to 4-4th size, suddenly broke in the printing frame, leaving a print three-quarters finished. This being a third order, the original card was long since returned; time was short, and 'What shall we do?' was the word. Immediately preparing a plate, the unfinished print was placed under a clean glass just as it came from the frame; a careful focus and exposure in soft light gave a valuable negative, and 'bridged the chasm.' Truly, 'necessity maternizes invention.'"

To Correspondents.

Nebula says:—"Will you be kind enough to point out the cause and prescribe a remedy for the following case of pinholes? A negative bath was made up, about two months ago, after the formula given by Jabez Hughes, a part of which is the addition of nitrate of baryta, which he affirms totally prevents pinholes. I have only immersed ten plates, and the last two are covered with pinholes. The bath was filtered twice at the beginning, and has frequently been exposed to daylight and sunlight. The collodion was Mawson's, newly purchased three weeks ago. The developer was after Hughes' formula also." This is another of the very frequent perplexities which are brought under our attention, when all the conditions are, according to description, perfectly right, and all the results utterly wrong. Even with a bath out of order, the majority of those from whom we have experience find that the nitrate of baryta is a remedy for pinholes, whilst our correspondent, with a new bath, which should be in good condition, finds abundance of pinholes in spite of the baryta salt. It is impossible under such circumstances to point out the cause; at best we can only conjecture possibilities. Possibly you have made a very small quantity of silver solution, which is easily and quickly exhausted. This is a common source of trouble. Possibly you have employed excess of the baryta salt. Possibly you leave the plates too long in the bath, for this, under some conditions, will cause pinholes. 2. The keeping qualities of collodion depend upon its preparation and the salts added to it. A simply iodized collodion, in which iodide of potassium or of ammonium is used, will often deteriorate in sensitiveness in a few weeks, and be worthless in a few months; whilst if iodide of cadmium were employed, it would improve for a few months, and keep good several months. If a bromide is added as well, the keeping qualities may be extended to a very great extent. We have prepared collodion with mixed iodides and bromides which has worked better at the end of two years than at the end of two weeks. The quality of the pyroxyline and solvents also affects the matter. 3. If everything be working well, a newly mixed iron developer may be safely used; but if there is a tendency to fog, or in the hands of an unskilful manipulator, it is better a few days old. We prefer keeping the iron always ready in saturated solution. 4. As a rule, a ready sensitized paper tones best in the bath recommended by the preparer of the paper. If no such instructions are given, try the acetate bath.

R. T.—Many manipulating cameras for working wet plates in the field without a tent have been contrived, and described in our columns; and some have been patented. There are two principles, upon one of which such manipulating cameras generally depend. In one there is a hood or covering attached to the camera, permitting the arms to enter and manipulate whilst the operations are watched through non-actinic glass; and in the other the coated plate is placed in a light-tight frame or cell from which it can be lowered into the silver bath to sensitize, withdrawn, exposed, immersed in a developing bath, &c., without exposure to light, the light-tight frame protecting it during each operation. If yours be distinct in principle it may be new.

J. L. Ranking.—We do not know of any agent in England for M. Jonte's camera. Herr Warnerke, of No. 10, Linden Grove, Peckham Rye, has taken an interest in the camera, and may know whether any agency is intended.

T. D. Widdas.—To protect your designs each one must be registered under the Designs' Act. Registration will not protect the method. We regret that we have not time to answer questions from correspondents by post.

A. B. C.—We should recommend you to have the oval. In the first place, it will not detract, we think, in the slightest degree from the effect of the picture. We have just traced an oval on your print, and find that it does not cut away anything which is important, and certainly does not detract from the effect. The attempt to obtain a dome-shape (like that sent) would involve much trouble and some risk and cost. It is very probable the dome-shape would have to be made purposely, and be, therefore, necessarily more costly, and, possibly, not so good in quality. The shape in a large plaque would involve more risk in firing. The oval shape will, probably, be in stock, and its quality and proper treatment quite understood by the enameller.

O. A. M.—We do not know of any one who gives lessons in retouching; but it is probable that those engaged in such work will undertake to teach. You will find in our advertising pages the announcements of two works recently published on the subject; it is probable that the authors will be willing to give personal lessons. We have no information as to terms. Much must depend upon the aptitude of the pupil as to the number of lessons required; but two or three lessons might serve for a person already skilful with the pencil.

C. Reeves.—We believe that the paper employed in printing by the Woodbury process is subjected to a very heavy rolling process, as evenness in texture and thickness in the paper are imperative; but we are not aware whether it receives any especial sizing preparation.

A. Noel.—There is no method of restoring your old, red, and rotten collodion. When the film is rotten there is no hope. But you may find it useful to add a little very carefully to a new sample which gives a film too tough and repellant. 2. The ether you have added has been impure, probably old and acid. We do not know of a remedy. Try agitating with a little powdered carbonate of soda; and, after perfect subsidence, decant, and try another plate. 3. Add to each ounce of silver solution three grains of nitrate of baryta.

John Terras.—The "Sciopticon Manual," price 1s., will give you all details. Remember that the Sciopticon is protected by patent.

J. C. H.—A preparation containing so much per cent. of anything (say nine per cent. bath) is a bath containing nine ounces of the silver salt in one hundred ounces of water. The coffee formula you quote means ten ounces of ground coffee and four ounces of sugar in one hundred ounces of water. Of course, grains or drachms may be used throughout instead of ounces.

F. M. Sutcliffe.—Thanks for explanation. We fear that the paper has been, as you suppose, injured by damp.

A Printer.—The general stock of albumenized paper ought to be kept in a dry place. If kept in a damp place, some forms of decomposition in the albumen are often set up which cause spotty prints. We have no reason to suppose it will alter the texture of the finished print. If paper, however, be kept very dry it is somewhat difficult to manipulate. It is best kept in the dark room for a few hours before use, so as to absorb sufficient moisture from the atmosphere to prevent it being "bone dry" just before floating.

A. B. C.—You do not print sufficiently deep. Almost all toning baths would leave prints 3 and 4 too pale after toning. The prints are scarcely a trace too deep for finished prints, and there is almost invariably a little bleaching and reduction in toning and fixing, especially with a new toning bath and a strong hypo bath. An old toning bath bleaches least. Your negatives are scarcely quite sufficiently intense. They yield fine prints before toning and fixing; but there is always risk in such case of the finished prints lacking a little force and brilliancy.

Novice.—If you contemplate fitting up a studio with a view to professional photography, we fear you are much too inexperienced to have any chance of success at present, as you have manifestly much to learn from reading and study, as well as practice. The equipment of a studio must entirely depend upon your means and aims, and until you really know from experience what you require and wish to do, it will be unwise to attempt professional photography. For card portraits a background about eight feet high, coloured grey, will serve. There are half-a-dozen dry plate processes, each in result, when skilfully worked, as good as the other. These have been fully described and discussed in our pages. There are various modes of vignetting, each good when properly managed. Vignette glasses, supplemented by cotton wool, answer well. Brown ferrotype plates are used in the same manner as the black ones; they are coated with positive collodion, excited in the bath, exposed, and developed with an iron solution. We should recommend you to obtain one or two good instruction books, and study them carefully.

Received.—"The Art of Retouching," by Burrows and Colton (in our next); also Abstracts of Specifications of Patents, Colony of Victoria.

Several Correspondents in our next.

The Photographic News, November 10, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Photography as an Aid to Siege Operations.—During the terrible fighting that took place around Alexinatz last month, when the Turks never ceased for some days in their furious onslaught on the Servian positions, and cannon exchanged shots night and day, until the defenders could withstand their enemy no longer, the idea more than once crossed our mind whether the suggestion of the late M. Auguste Chevalier could be turned to any practical value in warfare. The inventor of the *Planchette Photographique*, or photographic plane-table, for many years made the application of photography to military purposes his especial study, and we were fortunate enough some years ago to hear something of the results which the skilful optician achieved. M. Chevalier worked assiduously to develop the practical value of the camera in levelling and surveying, and his little instrument has been enthusiastically referred to by photographers and engineers of almost every European country. The method he elaborated of securing rapid surveys and maps by the aid of a sensitive plate are known to our readers, and for some time he was engaged with Captain Jouart, of the Imperial Guard (when France yet possessed such a body of men, and it had not come to an end inside Metz), in applying his knowledge to aid military engineering. He hoped to regulate the pointing of guns in a battery, and was sanguine about being able to guide the reflection of an electric light at night against an enemy's work with the assistance of his photo-surveying instrument. Our readers may remember that the photographic plane-table of M. Chevalier is a combination of a surveying instrument with a photographic apparatus by means of which the different elevations are automatically registered upon a horizontal sensitive plate (upon which the direction of the magnetic meridian is also marked), and this latter, after receiving some slight additions at the hands of an ordinary draughtsman, is then used as a negative, from which any number of prints may be taken. To produce a similar result with the aid of an ordinary theodolite requires the performance of several long and tedious operations, in which the commission of errors is not unfrequent, so that the Chevalier plane-table does the work not only more speedily, but likewise far more correctly, as the number surveying signals may be increased without involving more labour. In a word, the Chevalier instrument is almost an automaton theodolite. It was this instrument more especially with which Monsieur Chevalier and Captain Jouart worked for some time, and, indeed, up to the death of the former, who had, during the last few months of the experiments, enjoyed the warmest sympathy of the late Emperor. The latter at once comprehended the importance of the results, should these be obtainable, as M. Chevalier himself was convinced. At Vincinnes, experiments were practically carried out by day and by night, where, indeed, it was contemplated to put M. Chevalier's plan to the test. He pledged himself to the Emperor that he could obtain the following results for aiding in siege operations, namely:

1. By employing proofs obtained with his instrument to regulate in the most certain manner, during the night time, the direction of fire against an enemy's works, as likewise the angle of reflection of the electric light to be used for illuminating the enemy's position.

2. In like manner to regulate the convergent fire of either one or more batteries as well during the night as during the day.

It is quite needless to point out the advantage that would be possessed by one party over another in the case of one of them being able to continue a bombardment throughout the night. It is generally supposed that damage done during the day is made good, as well as possible, in the night time, and, under cover of the dark, working parties work silently and assiduously to repair the execution done by the enemy's guns. If we suppose for a moment, however, that no rest whatever is given to the enemy, and that you can continue to fire at his works with the same accuracy during the night as during the day, while he, on his part, is unable to reply because he cannot take aim, the advantage you gain is naturally inconceivable. Chevalier was confident he could aid in this matter, and the Artillery and Engineer officers to whom his proposition was referred looked upon the matter so favourably that, as we have said, the Emperor went so far as to order a practical demonstration of the method to be given before him at Vincennes. Unfortunately for the ingenious inventor, a cruel sickness overtook him a short while after the Emperor had given his consent to the pet project of Chevalier's life, and the optician died before any further steps could be taken in the matter. Captain Jouart, who was for several years at the head of the government photographic establishment in France, took up the matter warmly on Chevalier's death; but the gallant officer did not possess sufficient details of Chevalier's *modus operandi* to work out the problem set forth by the learned optician, and consequently no trials such as the Emperor contemplated at Vincennes ever took place. The Chevalier plane-table itself has many times received useful application in military and civil surveying, and it has already been discribed in detail in these columns. Whether Chevalier's dream will ever come true, that the photographer will one day be able to assist so materially as we have shown in conducting siege operations, may be a moot question; but Captain Jouart himself assured us, several years ago, that he had every confidence in the success of M. Chevalier's experiments. He had worked with that gentleman during the latter part of his life, and had known him to be a sound and conscientious investigator. Strange to say, that since Chevalier's death in 1869 no one seems to have considered it worth his while to cultivate the matter and to bring it to an issue, notwithstanding its great importance. Germany, unfortunately, has not a military photographic establishment, or else we should have naturally looked to her as the rival of France to settle the point one way or another. She has employed photography in the field, to wit, in the last Franco-German war, where a party of military photographers did useful work in surveying, &c., around Strasburg and Paris. But Germany—unlike France, Great Britain, Austria, and Portugal—does not possess a permanent establishment devoted to photography, and there is no department, therefore, in that country to take up such a subject. We must suppose, perforce, that the details of the Chevalier invention were not permitted to transpire, for if the French had been able to apply, or make use of it, they would have had ample opportunity of doing so during the siege of Paris. Chevalier's plan, if we may give him credit for having matured one, must have remained locked in his brain at his death, and we fear that those who would attempt to carry out what he suggested will find they have set themselves no easy task to accomplish.

FRENCH CORRESPONDENCE.

Opening Meeting of the French Photographic Society—M. Janssen's Lecture on Photo-Astronomy—His Automatic Method of Solar Photography—M. Scotellari's Method of Photographing with Violet Light—A New Portable Laboratory.

The French Photographic Society held its first meeting on Friday, the 3rd of November, after its annual holiday. The distribution of the awards declared at the close of the last exhibition having to be distributed on this occasion, there was naturally a larger attendance of fortunate prize-winners; but, unfortunately, there was otherwise little to attract members. Our experimenters seem to be still in that lethargic state which holidays sometimes bring about, and we may, therefore, consider them as not yet returned to their every-day duties.

The most important feature of the evening was a succinct summary of the application of photography to astronomy, delivered by the eminent astromoner, M. Janssen himself.

The worthy academician, who has himself silently made many wonderful applications of our art, gave a brief description of the numerous services rendered by photography to the science of which he is one of the principal exponents, and then at once came to a subject which, at the present moment, is creating a good deal of interest in scientific circles, namely, the passage of planetary bodies between Mercury and the sun. He alluded to the important rôle which photography has been called upon to play in this matter, and then showed how our art could be made to render assistance in connection with the problem.

To assure ourselves whether there is really a passage of planets between the sun and Mercury, and to determine, supposing this to be the case, the elements of these celestial bodies, it will be necessary to make observations of the sun continually for some time, and from different stations, so that there may be no interruption in the records. A much more certain mode of proceeding is, however, to take from hour to hour photographs of the orb upon which one could follow with mathematical exactness the progress of the phenomenon. To undertake, however, such a colossal work as this would require more than human energy, unless it could be done automatically, and this, M. Janssen has successfully accomplished. By the aid of the *revolver photographique*, of which he is the inventor, and for which England has just adjudged him the Rhumkorff prize, he has been able to effect the desired arrangement.

The eminent astronomer demonstrated to the Society the action of this ingenious apparatus, which we already have taken the opportunity to describe in one of our letters at the beginning of the present year. He showed how, by giving the instrument the proper dimensions, and by regulating the clock-work arrangement which turns the two disks, one carrying the sensitive plate, and the other the slits through which the light passes to trace the image of the luminary, it was possible to obtain eight or ten successive views. It was only necessary, he said, for the work, to put one intelligent person at each station, whose work would be confined to placing inside the instrument, after focussing, a circular plate prepared with a sensitive film of dry collodion, and to take it out again after sundown. The plates could be forwarded to the various stations ready prepared, and their development might be undertaken at the central laboratory to which all the negatives would be sent.

In this way M. Janssen obtains, as we remarked the other day, images of the sun measuring forty-seven centimetres in diameter, and these he exhibited to the members present, by whom they were very much admired.

A photographer established in France, but of Italian birth, by name M. Scotellari, forwarded to the Society a note, which was listened to with much interest, and which related to the new method of lighting up studios.

It is well known that the violet rays of the solar spectrum are those which possess the greatest amount of chemical activity and the least amount of heating properties. M. Scotellari has conceived the notion of having his studio tinted with this colour, shutting out other rays whose effects are injurious or neutral. To do this without having recourse to violet glass, which would be of a costly nature, and, at the same time, hardly uniform in its character, he has availed himself of a coloured varnish, and he has substituted violet curtains for those which he formerly employed.

Numerous pictures submitted to illustrate his paper proved that M. Scotellari's system of lighting is destined to render great service to photographers. One of our most skilful chemists, M. Prat, of Bordeaux, who has assisted at these experiments, asserts, in a special communication made to the society—

1.—That the violet light operates much more rapidly than the white or blue light—to such a degree, indeed, that the pose may be reduced pretty well one-half.

2.—By reason of the homogeneity of the tint reflected upon the sitters, the cliches are much more successful, and do not require the same amount of retouching.

3.—So far as the fidelity of the portraits is concerned, many persons who took very rapidly in ordinary light, acted more leisurely upon the sensitive film, and the consequence was a more perfect picture, and a calmer expression.

5.—The portraits, from an artistic point of view, are better modelled when produced exclusively by means of violet glass; they possess more detail in the high lights, and are less black in the shadow. The clichés are, in a word, remarkable for their delicacy, and far superior to those secured under ordinary circumstances.

M. Scotellari has secured his method of working by a patent, but he promises to give every facility for the plan being practised in all directions.

The meeting terminated by the exhibition of various new apparatus, among which was a very ingenious portable laboratory, shown by M. Franck de Villecholles, which was the invention of M. Terpereau, of Bordeaux.

Ernest Lacan.

ON TRANSFERRING NEGATIVE FILMS BY AID OF GELATINE.

BY M. JEANRENAUD.*

Having experimented for some months with collodions of different makers, I found some that offered so great a resistance when they had to be removed from the plate that they split; half of the thickness of the collodion came with the gelatine, whilst the other half remained on the plate. Many unsuccessful attempts have deprived me of clichés which promised good results; but I have succeeded in mastering this difficulty by a process which I advised my colleagues to use when they meet it.

After having passed the cliché which has been finished, fixed, washed in acidulated water containing seven cubic centimetres (two fluid drachms) of ordinary muriatic acid for one hundred cubic centimetres of water (three and a-half fluid ounces), as I advised in 1868, it is allowed to dry, and the plate is then covered with the following solution, which is flowed from each of the angles towards the opposite one:—

Alcohol at 40°	75 c.c.	2½ fl. oz.
Water	20 c.c.	5½ fl. dr.
Muriatic acid	5 c.c.	1⅓ ,,

It is then dried without washing. The cliché is now ready to receive the coating of gelatine. The above solution can be used indefinitely, especially if care has been taken to pass the plate in acidulated water, as mentioned above, an operation which will afterwards prevent the alcoholic liquid taking a brown colour.

In the preparation of the gelatine which is destined to remove the cliché from the plate I have made a slight change, which appears to give preferable results.

For a plate 11 by 13 inches, I advised, in 1868,—

Gelatine	20 gram.	308 gr.
Water	100 c.c.	3½ fl. oz.

After solution, glycerine, four cubic centimetres (one fluid drachm).

I find it useful to add to this preparation forty cubic centimetres (eleven fluid drachms) of a solution of alum at two per cent. of water. This solution should be at the exact degree, as a few cubic centimetres more would render the solution of gelatine insoluble, and transform it into a paste.

The gelatine solution should be poured very hot upon the plate, which has been previously heated. This addition of alum renders the gelatine insoluble and imputrescible after desiccation, and it is not liable to mould-spots, as sometimes happens when kept in a damp place; besides, the cliché, when dry, has the appearance of a very fine ground-glass, which gives greater harmony to the print.

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* *Philadelphia Photographer.*

CARBON PRINTING IN PRACTICE.

BY DR. ADOLPH OTT.*

In carbon printing we make use of four different kinds of paper: 1, the pigment tissue; 2, the transfer tissue for single transferring; 3, transfer tissue for double transferring, or *transport definitif* (in French); and 4, the india-rubber paper, or flexible support.

1. *The Pigment Tissue.*—This is a paper uniformly coated with a compound consisting chiefly of gelatine and a pigment. It also generally contains a small admixture of glucose, soap, and glycerine, for the purpose of rendering it more flexible and more readily transferable. Fine lamp-black or good india-ink ordinarily forms the basis of colouring matter; but to this other pigments are added, in order to produce differently tinted tissues. The photographic tints—*i.e.*, such resembling gold toned silver prints—are produced by an addition of brown, red, or violet colours, such as sepia, crimson lake, venetian red, ultramarine, &c. Red chalk drawings may be imitated by using venetian red as a pigment; sepia effects, by sepia itself; and by the use of graphite as a pigment, the effect of a drawing in lead pencil may be produced. In fact, by employing various pigments, or mixtures of such in changing proportions, pictures in any colour and tint can be made; and furthermore, by the addition of a large proportion of colour to the gelatine, a vigorous print may be obtained from a feeble negative, whilst, on the other hand, soft and harmonious prints may be produced from hard negatives by the use of a tissue with a small proportion of colour. The reasons for this are obvious—the greater the amount of colour present in the film, of a certain thickness, the deeper will be the tint, and the less the proportion, the more delicate will the tones be. In our experiments, we have found that with the ordinary paper, as now in commerce, such as manufactured by the Autotype Company in London, and by Adolph Braun & Co. in Dornach, the best results are obtained from a vigorous contrasting negative rather than from a soft one. On this point Mr. G. Wharton Simpson, in his treatise "On the Production of Photographs in Pigments," expresses himself as follows:—"And here it may be well to mention that the kind of negative which suits best is a negative of full average density, with full detail in the shades, such as is got by ample exposure and development. There should be some, although little, absolutely bare glass; but whatever deposit of silver there is, on the deepest shades should be a pure photographic deposit, and not fog."

The pigment tissue, before being sensitized, will keep *ad infinitum*. It should be preserved in a cool, dry place; for, when left in the damp, it will absorb moisture, and may even become mouldy, and in a hot place it will curl up, and tear readily in handling.

In operating with this paper we must always bear in mind that in cold water gelatine swells only, without being dissolved, while it goes easily into solution, even in tepid water. At a temperature of 100° F. it becomes fluid, so that it may be filtered, but becomes solid again in the cold; but, when softened with water, the gelatine melts at 65° or 70° F. The property of the gelatine is the reason why so many fail in carbon printing during hot weather, because the gelatinous compound with which the paper is covered will readily run down if hung up, even if the paper has been sensitized in an ice-cold solution. In the hot season, the sensitizing and drying of the tissue should therefore be conducted in a perfectly cool place, or it should be laid on perfectly horizontal glass plates, and exposed in an airy place. And it may be of importance to state what, to my knowledge, has not yet been mentioned in connection with carbon printing, that during thunderstorms in summer gelatine is liable to be decomposed.

With tannin and combinations of alum it forms insoluble compounds, with perchloride of iron it becomes insoluble in the dark, but under the influence of light it becomes soluble again, thus rendering it possible to produce pictures from positive clichés. We shall, however, devote our attention especially to the deportment of gelatine towards chromic salts, the carbon printing process being entirely based on the same.

The Sensitizing.—The salt almost exclusively used for this purpose is the bichromate of potassa, $K_2 C_2 O_7$. It is derived from the chromic iron ore, a mineral occurring in the United States, in California, and Maryland, and abroad, especially in Norway, France, and Russia. Before the year 1820 the chromic salts found only little application; now they have become of the utmost importance in various branches of industry, such as dyeing, calico printing, for the manufacture of colours, mineral colours, as well as aniline dyes, for the bleaching of oils, the production of steel, &c.

Bichromate of potash is readily soluble in water in the proportion of 1·10, and keeps perfectly intact. The solution may be exposed to light for years without being decomposed in the least. But in presence of certain organic substances and by the action of light it is decomposed; and, singularly enough, this fact was discovered in the same year in which Talbot published his invention of silver printing, yet universally used in photography. But we may with certainty affirm that if carbon printing had at that time reached its present perfection, it would now be impossible to introduce silver printing in photography.

With regard to the combinations formed by the action of the two compounds mentioned, it was formerly supposed that the gelatine was oxidized by the oxygen liberated from the bichromate; but Mr. Swan has demonstrated that the gelatine is rather rendered insoluble by forming a combination with the deoxidized bichromate, and not by directly combining with oxygen, for the solubility may be restored by strong oxidizing agents, and we thus possess means to bring over-exposed prints back to the proper depth. I would propose to employ for this purpose ozone, an oxidizing agent also used for restoring engravings that have become yellow in time. But chromated gelatine is not only rendered insoluble in the light, but also in the dark; and, as I have found, especially during hot weather. According to Dr. Vogel, sensitized tissue becomes insoluble after a week, when left in the dark, and Mr. G. Wharton Simpson states that he has kept it for a fortnight without change; but I suppose this depends, also, upon the quality of the paper. Slow drying aids decomposition; in any case, it is best to use the tissue on the first or second day after sensitizing. This manipulation is best effected in a nearly saturated solution of the bichromate in water—*i.e.*, in one of the proportion of 4·100. Some add to this solution a little ammonia, it being stated that the tissue thus becomes more sensitive. If this is the case, and when more sensitiveness is desired, I would give preference to the bichromate of ammonia, or to the double chromate of potash and ammonia. I understand that the Autotype Company in London is selling a salt which is a mixture of equal parts of the ammonia and potash salt. I have used such a one with much satisfaction in the heliotype process, but of its action in carbon printing I cannot speak from experience. The paper is only immersed for about one and a half to three minutes, for, if left longer, it loses toughness, and drying is retarded by the large quantity of liquid absorbed. In summer it is absolutely necessary that the solution be perfectly cool, and this is best effected by placing the same in a refrigerator prior to its use, not by placing ice in it, as by repeating this operation the liquid would become too diluted. In a warm solution, the coating is readily removed. As to the drying, it takes place much quicker when the surplus of the solution is removed by laying the tissue upon a glass plate, the prepared side towards the glass, and then, by going with the squeegee over it. In this case it will dry in one hour, of course, when hung up; otherwise, the drying requires at least two hours, generally three. In winter, and during damp weather, it is is best to heat the room. In sensitizing, seclusion from daylight is not required; but the drying must, of course, be conducted in the dark room. Small sheets are best hung up with clips; large ones should be laid on cardboards, hung over a stick. After the lapse of an hour, they can be hung up like the former.

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* Read before the Photographic Section of the American Institute, and reported in *Anthony's Bulletin*.

The tissue for single transfer is an ordinary paper with a coating of gelatine. If no gloss is desired, a solution of 5-7½ per cent. is taken; for pictures with gloss, one of 10 per cent. The dry sheets are subjected to a pressure in a hydraulic press.

For Flexible Support.—Such a paper is coated with a varnish consisting of 500 grammes of bleached shellac in 5½ litres of water, to which previously 120 grammes of borax and 30 grammes of soda carbonate have been added. After drying, the sheets are rolled between metallic plate.

The Paper for Double Transfers.—is essentially a gelatinized paper containing varytes-white (carbon of varytes), which had been partly rendered insoluble by chrome-alum.

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METHOD OF PRINTING AND FINISHING A VERY PERMANENT PICTURE UPON PAPER IN FIFTEEN MINUTES.

In his handbook entitled "Photographie en Amérique," M. Liebert published the following method of rapidly getting through the photographic process. He says:—

It is sometimes useful to produce a positive upon paper in a very short time, which is quite impossible under ordinary circumstances, for the usual manipulations involve at least a dozen hours to carry out. For this reason many photographers may be interested in the process I am about to describe.

Put into a stoppered bottle, kept away from the light, a mixture of,—

Filtered water	500 grammes
Citric acid	30 ,,
Citrate of iron and ammonia	15 ,,
Concentrated liquid ammonia	30 cub. cent.

After mixing, the whole to be filtered.

Apply this solution to the surface of a sheet of positive paper which has been stretched on a board by means of drawing pins. The best way to do this is to take a large camel's-hair brush, and to apply the solution along and across the paper by its means until the surface is well covered. This operation is, of course, carried out in the dark.

The paper thus prepared assumes a dark yellow tint. It is printed, when dry, in the ordinary printing-frame, taking care that the whole surface is exposed to the action of light at the same time. A very brief exposure is sufficient, and as soon as the principal outlines of the print become apparent, you need go no further. You examine the image in the dark room previously to taking it from printing-frame, and do not open the latter except in this locality. When taken from the frame the sheet is put into a bath face uppermost, or upon a glass plate. The image is first moistened with distilled water, and then a developing solution made up as below is applied:—

Distilled water	500 grammes
Crystallized nitrate of silver	16 ,,
Concentrated liquor ammonia	8 cub. cents.

This mixture, after filtration, is poured over the print, which soon shows in all its details, but appears of a disagreeable reddish colour. The developing liquid, after filtration, may be preserved and used again.

After development the print is carefully washed, taking care to allow a stream of water to fall upon it, and is then fixed in a bath of—

Distilled water	500 grammes
Hyposulphite of soda ...	30 ,,
Chloro-nitric acid	10 ,,

In this bath the print remains for some minutes only until it has assumed to a dark purple tone. It is rapidly washed in a basin of warm water, and further mixed in two or three changes of water; the image is finally sponged by pressing between sheets of filter paper, and dried by means of a spirit-lamp. Afterwards it is mounted, rolled, and varnished. You may modify the tone, if it is not satisfactory, by changing the proprotion of the hyposulphite of soda, and putting a little chloride of gold in the fixing bath. The addition of a little quantity of a saturated solution of gallic acid in the developer will also bring about a different tone.

A paper positive may in this wise be produced from a negative which, in the ordinary way of printing, would yield a picture of too under-exposed a character. Very often, too, the process may be made use of in the production of enlargements, especially in winter, when the sun has very little power, and could hardly produce a vigorous print by chloride of silver printing. I do not, of course, pretend to say that the pictures rival the charming productions to be obtained under the most favourable circumstances with albumenized paper, but, nevertheless, the method will render good service in a hurry, or when a satisfactory impression cannot be obtained by the methods in daily use.

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DULL DAYS IN THE STUDIO.

A CORRESPONDENT of *Anthony's Bulletin* makes some suggestions for filling up idle moments in the studio. He says:—

"Necessarily there are no idle moments in the photographic studio—no need of yawning and lounging about for want of useful occupation. In every department there is work enough for willing hands to do, rain or shine; and, if the 'head of the house' is level, he will see to it that his subordinates are provided with useful, if not at all times particularly agreeable, occupation. To say nothing of the requirements of order and neatness in the several work rooms, as well as the reception and sales rooms, there are always little matters of repairing and adjusting, which the operator, closet hand, and printer, in hurried moments, deferred till a more convenient season, which season is now when no orders are pressing and no sitters in waiting.

"Your bath needs cleansing and renewing; your shields are loose-jointed and leaking light; your chemicals need filtration; your camera and lenses require re-adjustment; your posing chairs are shaky, discoloured, and sadly in need of renovation for decency's sake; and numerous other little matters apparently of trifling consequence would be all the better for a little, or, if you please, a good deal, of timely attention.

"And then the printer's quarters: Is everything in place, and there a place for everything—we mean, of course, everything needful? Are the printing frames of working order, the negatives carefully classified—accepted, doubtful, and rejected—and conveniently placed for the duty that awaits them? Are the silver clippings and solutions prudently bagged and bottled, and have you done all that an ingenious and 'inquiring turn of mind' would suggest to make this branch of the photographer's savings bank a paying success? Finally, have you straightened up things about the room with a view to satisfy as well as neatness, so that the insurance examiner, calling unannounced, would not write you 'specially hazardous,' and charge your employer accordingly?

"And now, Miss Blank of the reception room: Are you waiting for a customer, and while waiting have you taken up your embroidery or the last novel, or, what is more likely, a position of rest on your elbows, with hands supporting a head not able to comprehend the fitness of things in the duties assigned you? If unable to wield the broom and dust brush, you have, of course, had the service performed, and in the meantime you have brightened up the showcase, arranged in tasty order the specimens therein and thereabouts, and you have not forgotten the disor er in which you or some one else left the cabinet of drawers the other day in looking for a needed mat, passepartout, or frame; and you have looked into the toilet or dressing room, and seen that the mirror reflected the image of a neat and tidy attendant; and then you have looked over the promised work and appointments to know of yourself that they are not to result in disappointment when the specified time arrives; and finally, you have carefully surveyed the field over which you hold dominion, and find it not deficient in any of those little attractions and matters of taste which your thoughtful brain and industrious hands could supply. Then you and the operator, the closet hand and the printer, are always busy and usefully occupied, and the proprietor, if he is observant and appreciative, as he should be, is happy in the possession of such help.

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THE DEFECTS IN CARBON TISSUE, AND THEIR CURE.

BY DR. J. SCHNAUSS.*

Photographers are not the only people who have to do with glorious uncertainties, but they have laboured so hard at their work that there are far fewer instances of the existence of these than formerly. The precautionary measures taken in reference to iodized collodion and albumenized paper through a period of twenty to thirty years have given us some insight and power over these materials, but such is not the case with the new pigmented tissue. And, in truth, those who know the chemical character of the principal component of the material, namely gelatine, will not wonder if, not only in operating with the tissue, but in its mere preservation, far greater difficulties crop up than in the case of albumenized paper. Gelatine is far more hygroscopic than albumen, and it is not, as in the case of this latter, coagulated and rendered almost insoluble on being placed in the sensitizing bath; on the contrary, after such treatment it shows great sensitiveness to moisture, heat, and cold.

From the experience of those gentlemen learned in carbon printing, Dr. Liesegang, Van Monckhoven, and others, we were aware of the conditions necessary to the proper treatment of the tissue, and also that carbon printing is a more difficult matter in summer or in hot climates, than it is in winter or more temperate localities. Many novices, however, who practise this beautiful printing process must have been disagreeably surprised, upon hot and dry days, to find their tissue become suddenly horny and brittle, so as to be handled with difficulty. If there was nothing remarkable in the tissue before it was sensitized beyond being rather sticky when moistened, these glaring defects nevertheless became apparent enough after floating upon the bichromate bath, and drying even with the greatest care. The whole of the evil connected with the operations of sensitizing, squeezing, and developing may, indeed, be summed up in the phenomenon of the tissue becoming a hard, water-repellent mass, and partaking to all appearances of tissue that has been exposed to light. It is clear that any attempts made to palliate or prevent the evil must be undertaken before it is put into the chromate bath. For a long time any efforts to do something to meet the defect remained without success, and it became a question what was to be done with the costly rolls of pigment tissue after they had become apparently unsuitable for photographic purposes.

At last a rather simple manipulation brought me to a satisfactory solution, so far, at least, as the greater portion of my stock was concerned. I started with the idea that the dried gelatine film, so to speak, must have a new porous surface secured to it, the action of a moist atmosphere being, as a rule, quite insufficient. Sheets are cut from the rolls of a size that will conveniently go into a porcelain dish, and these are then dipped one by one into cold water. As soon as they lie flat they are taken out and laid down, face uppermost, upon a level glass plate, that should be placed in a perfectly horizontal position. A vessel full of pure warm water (50° C.), to which about five per cent. of sugar and a similar amount of glycerine has been added, is at hand, and into this a broad camel's hair brush is dipped. With this solution the pigment tissue is coated as uniformly as possible. The gelatine will, according to the higher or lower temperature of this aqueous solution, be more or less dissolved; if the water remains warm, the solution will go on to a considerable depth, and for this reason great care is necessary in plying the brush backwards and forwards, so that the surface of the pigmented gelatine may still be even and uniform. In any case, however, the solution of the pigmented mixture must not be permitted to go on so far that the white paper shows underneath.

As soon as pigmented tissue so treated has cooled and set, it is permitted to dry slowly in a cool locality which is free from dust and impurity. It will be found to possess, after its restoration in this wise, a very fine and brilliant surface, and to absorb the bichromate bath, or any other solution, with considerable facility, while the pictures produced with such tissue are no longer grey and meally as they were before, but black and vigorous in character. Two prints produced from the same roll of tissue—the one, however, printed from the material before any attempt has been made to improve it, and the other afterwards—will at once show the benefit to be derived from the operation which we have described.

Such tissue as is described "Purple for portraits," offers no difficulty at all to the method of restoration I have suggested; but, on the other hand, the black pigmented tissue, such as is employed for the production of dispositives, I found to be completely incurable. It is, however, a great thing to have it within one's power to render serviceable again the majority of tissue that one may happen to have in stock.

Electroplating of Leaves, Insects, etc.—A new and improved method of metallization of organic substances, so as to fit them for receiving galvanic deposits, has been devised by M. Cazeneuve. It is both more rapid and more safe for the operator than the ordinary way. The nitrate of silver which serves for the metallization is dissolved in wood spirit, by which means a thorough impregnation of the object is obtainable. After maceration (more or less) the object is dried through rapid agitation, but while still moist it is submitted to a saturated solution of ammonia gas, and thus is formed a double nitrate of silver and ammonia, easily reducible. Drying is then completed at a mild temperature, and the object is then suspended in mercurial vapours and completely metallized in a few minutes. By this method, the author says, he has obtained a regular layer of copper on leaves, flowers, insects, &c.—*Scientific American.*

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* *Photographische Archiv.*

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THE PROGRESS OF RETOUCHING.

A glance at the history and progress of retouching is both interesting and instructive. In the earliest days of photographic portraiture, retouching was not only unknown, but impossible. The exquisitely delicate surface of the Daguerreotype would not tolerate for a moment the touch of mechanical amelioration; except, indeed, so far as the process of tinting or colouring effected that end. The colours were applied in the form of an impalpable powder, and the result of their application had more the character of a stain than of applied pigments. The finest touch of water-colours was so incongruous with the delicate surface of the picture that a coarse patchy effect was the result in all cases, no matter how skilfully applied. Curiously enough, the untouched Daguerreotype presented fewer of the crudities of texture, was less cruel in its renderings of wrinkles, freckles, and rugosities, than any later form of photographic portraiture.

On the advent of the collodion process, photographs on paper gradually superseded the Daguerreotype. At its best, the paper print fell far short of the delicacy of the Daguerreotype, and at its worst it was often a sadly coarse, stained, smudgy affair. Now commenced the practice of retouching on the print to remove technical defects, and ameliorate, as far as possible, what appeared to be inherent photographic shortcomings. Then followed those abominations consisting of photographic prints entirely worked up in Indian ink or sepia, the photographic image being generally destroyed, and a hard, unnatural, badly drawn monochrome presented in its place. The idea of retouching on the negative very tardily dawned on the photographic community, and it is only within the last ten or twelve years that it has come into general practice. Of course the removal of blemishes like stains and pinholes in the negative was customary; and we have personally more than twenty years ago modified the light and shade on the negative background by the aid of powder colours. It is probable, moreover, that for many years before the practice of retouching had become general, some photographers manipulated their negatives considerably, carefully preserving their practice in this way as a secret. We remember a case many years ago at a photographic exhibition, when the fine contributions of a very able photographer were challenged by another portraitist as being retouched. The response to this was an offer to permit the prints to be sponged with water. The challenger insisted that the stippling was manifest beyond question when the prints were examined by a magnifying glass. The production of unmounted prints with precisely similar gradation, which was not removed by sponging, seemed to settle the matter by deciding that there could be no retouching, the negatives never being suspected.

The use of lead pencils for retouching upon the negative first rendered this operation possible as a popular process. Stippling upon a varnished surface with wet pigments was a difficult process, requiring great manipular skill, and few of those possessing that skill were familiar with the requirements of negative retouching, in which the degree of opacity or translucency of each touch is of more importance than its appearance by reflected light. The first suggestion for the use of lead pencil for this purpose came from Germany, and we remember that on its first publication in this country, in our pages, a provincial portraitist, of great ability, wrote to thank us for the information, remarking at the same time that he considered the subscriptions to the Photographic News for a lifetime would have been well repaid by this piece of information alone. Since that time the system has steadily progressed. Its use in any degree has been strongly condemned by photographic purists, as a departure from the truth as it is in photography, and, curiously enough, one of its most staunch opponents was one who was unrivalled in the artistic manipulation of the negative in printing operations—the late O. G. Rejlander. In the earlier years of negative retouching, photographers would confess its use with apology and hesitation. It has now, however, acquired a firm foothold in the studio of every portraitist, and the skilled retoucher is indispensable. In this country the legitimacy of the process, *per se*, is no longer discussed, but is, by general consent, tacitly admitted. Excess is, of course, condemned as inartistic, untrue, and unwise, even by those who most egregiously overstep the fair line of legitimacy. Photographers in the United States occasionally discuss the subject still. In the beginning of the present year we printed a paper by M. Rulofson, of San Francisco, in which he defended the practice as necessary to meet the demands of the public, every individual of whom, whilst professing to require the simple truth of photography without retouching, invariably protested against receiving a portrait in which the retoucher's art had not been carried to the utmost limits possible. Another American portraitist, writing in our Philadelphia contemporary, admitting and regretting this demand for sophistication, sees in its unreasonable excess the hope of re-action. He says:—"Like a raging fever, the retouching mania must run its course. We photographers are but the humblest servants of the public in the domain of art, and must not dictate, but obey. Then let us give the public a surfeit of falsehood, until, cloyed with the sweet poison, it turns itself to demand the plainer, but more wholesome, fare of truth. Or if the love of lying flattery is so inherent in human nature that no amount can cloy, let us believe the universal law of compensation will turn the seeming evil into lasting good."

Where excess of retouching not only levels all ages, and makes it difficult to distinguish the portrait of the grandmother from the pretty girl of twenty, who is so like her; and where it destroys the texture of flesh, and substitutes that of chiselled marble, its evil is beyond dispute. Where it is or may be used for purposes of fraud, the evil is still more lamentable. We recently heard of a case in which a portrait from an untouched and somewhat harsh negative, and one from a fine negative of the same sitter, very carefully retouched, so as to remove lines, wrinkles, and rugosities, were prepared for exhibiting in court, the latter as showing the state of an individual before a misfortune for which he claimed damages, and the former as showing the distressing effect produced upon his health by the misfortune for which damages were claimed. It is probable that the two portraits were produced in the order of time claimed for them; but the misused art of the retoucher might make either of them tell the tale either of decreptitude or vigorous health.

Nothing, perhaps, better illustrates the universality of any system than the fact that it begins to create a literature of its own. For years past retouching has been the subject of constant articles in the Photographic News, the Year-Book, and other publications, and much detailed practical information has been published on the subject. Within the last few weeks three distinct brochures have been issued, chiefly devoted to the subject. The first of these was fully noticed in our pages a few weeks ago. The second is an unpretending little tractate addressed by Mr. Harding Warner to amateurs, giving them useful hints as to the mounting and retouching of prints.* The last is the most important work yet devoted to the subject. Messrs Burrows and Colton have produced a handsome octavo volume of sixty-four pages† in which not simply the technical details of retouching are fully stated, but a minute and clearly written treatise on the anatomical structure and drawing of the face is given. It is the most comprehensive book which has been devoted to retouching, and, carefully studied, ought to enable any one, with sufficient manipular aptitude, to become a skilful retoucher. A thoughtful perusal of the chapters devoted to the anatomy of the face, so as to master thoroughly the use and operation of the various muscles, and the effect of slight modifications in not only modifying expression, but in suggesting youth or age, will prepare the student to commence his practice in retouching not merely with a much higher intelligence than before, but with a very different estimate of the importance of the work, and of the serious blunders he may make if, through carelessness or ignorance, he alters the drawing of a human face.

The common complaint against excessive retouching is much less justification than is supposed. That which is frequently described as excess in retouching is less the result of excess than of ignorance. It is not that there is too much of the pencil, but that it is applied in the wrong place. A very little unskilful retouching, will remove the texture of the flesh, and leave that of stone; will remove the expression of a living face, and leave that of a mask; whilst the same amount of retouching applied with knowledge and intelligence, would have retained the texture of flesh, removing only the temporary and accidental blemishes and the exaggerations of photography which interfered with truth and beauty; would have given fuller effect to a fine expression, or subdued a suspicion of frowning or weariness by delicate touches applied in the right place. One of the first results of reading the work before us, and studying the mechanism of the face in the plates will be to induce modesty in the student who is ignorant of drawing. We have seen photographers, innocent alike of the structure of the human face and of any knowledge of drawing, unhesitatingly proceed to retouch a negative, without the slightest idea than any other qualification than a photographic eye and a steady hand were necessary. They have neatly filled up wrinkles and scars and softened shadows, until they have produced a face almost as smooth and quite as expressionless as a billiard ball. And, what is more, have been proud of the result! As we have said, a study of this book will do much to remove presumptuous ignorance, and, so far as knowledge will produce skill, it will tend to improve the quality of retouching generally.

We may add, that the various appliances required are described; the various modes of retouching in use examined and compared, and the best modes minutely explained. A chapter is also devoted to enamelling and finishing prints. And a welcome addition to the volume will be found in the specimen negatives, one retouched and one in its original state, which may be detached from the volume and used for printing purposes.

THE PHOTOGRAPHIC EXHIBITION.

In glancing round the exhibition in search of illustrations of special processes, we are more struck than before with the singular paucity of novelties in this direction, and with the fact that, with one or two exceptions, nothing is exhibited this year as an example of the process by which it was produced. This is, in one aspect of the case, satisfactory, inasmuch as it suggests that artistic excellence, rather than technical skill, is now the aim of photographers. The ultimate end of photography, with the majority of its devotees, is the production of pictures; and the majority of the exhibitors challenge consideration on pictorial grounds, quite independent of the manipulatory and chemical operations by which these pictures were obtained. On the other hand, an exhibition without examples of novelty in process or appliances has a tendency to suggest a stagnation of interest amongst experimentalists, or a paucity of invention amongst those whose attention is given to photographic research.

Interesting as, at least, novel in a photographic exhibition, are the examples exhibited by the Albion Albumenizing Company, of the platinum process, patented a couple of years ago by Mr. Willis, jun. This process has already been briefly described in our pages. Paper duly sized is first floated on a very weak solution of nitrate of silver. It is then dried and treated with a mixture of chloro-platinite of potassium and oxalate of iron. It is then dried and exposed, the printing being very rapid. It then presents a very weak image, but, on floating or immersing in a warm solution of oxalate of potash, a vigorous image appears. It is then treated with a weak solution of oxalic acid, and, finally, with hyposulphite of soda, and then thoroughly washed. The pictures exhibited, and others which we have examined as produced by the Albion Albumenizing Company, are exceedingly fine, of a rich velvety rosy black tone, and, being upon unglazed paper, they present rather the appearance of fine engravings than photographs. Artists, who often seriously object to the glossy surface of albumenized paper, will find here a soft matt texture which will just please their tastes, either for finish as monochromes, or as a basis for painting. Nothing could be better for finishing in water-colours. Some years ago the fine velvety tones of the photographs of Mr. Hennah, of Brighton, used to be the wonder and admiration of photographers. These pictures much resemble, and in some respects surpass, the prints of Hennah. Consisting of platinum, or in some instances of platinum and gold, complete permanency is claimed for these prints. Time alone can give absolute assurance, but, looking at the constitution of the image, permanency may, we think, be fairly anticipated. The texture, colour, and general character are certainly pleasing.

Amongst the most interesting contributions to the exhibition are the various examples of Herr Warnerke's film process. Here we have examples of the film itself, of the negative, prints, and transparencies produced by its aid, the technical excellence of the whole being beyond challenge. An interesting point worth noting in connection with these examples is the varied tones, from rich chocolate tint to black, obtained in the transparencies. Experienced photographers are familiar with the fact that the colour of a negative or transparency depends much on the relative length of exposure and development. Herr Warnerke finds that in his tissue the tone is entirely under control in this way. A long exposure and rapid development yield images of a warm brown, whilst shorter exposure and prolonged development give a black image. Any doubt of the practical success of the film process must be set aside by the ample and successful display of results in the exhibition.

Carbon printing is, of course, very amply and admirably represented by the Autotype Company and a few others, although the number of exhibitors is by no means a guage of the number of photographers who are now regularly employing the carbon process as modified by M. Lambert. The Woodbury photo-relief process, as here illustrated, seems to have attained a degree of perfection which cannot be surpassed. Dry processes, so far as the information in the catalogue indicates, are scarcely represented at all, the chief examples being the fine examples of the collodio-albumen process, exhibited by Mr. W. D. Sanderson, and the charming little bits of Italian scenery produced with the Liverpool emulsion by Mr. Woodbury. Mr. M'Liesh exhibits some fine architectural examples, of large size, of the process by which his large heads exhibited last year were produced. The details are not given, but, so far as appears, the pictures are collodion transparencies, backed with white. They are at once delicate, vigorous, and effective. Mr. Faulkner's contributions, again, illustrate how artistically effective the powder carbon process may be made in skilful hands. Mr. F. York's stereoscopic contributions, both paper prints and transparencies, are very admirable, whether the subjects be views in London, studies in the museums, or animals in the Zoological Gardens. Mr. F H. Worsley Benison's stereoscopic renderings of botanical subjects — or, more accurately, of floricultural groupings—are exceedingly good.

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* "Simple Rules for the Mounting and Touching of Photo-pictures, specially designed for Amateurs" By Harding Warner. (Philip, Son, and Nephew, London and Liverpool.)

† "Concise Instructions in the Art of Retouching." By Burrows and Colton. (Marion and Co., Soho Square.)

On the tables, and standing in the room, are a variety of interesting specimens of apparatus, and some of processes. Some very admirably enamelled portraits are exhibited, as examples of his mode of treating prints in this way, by Mr. A. Oeffelein. A. and J. Bool show a portfolio containing interesting views of the old London which is fast disappearing under the operation of modern improvement. The Autotype Company exhibit a volume illustrated by photo-collographic prints; the Fine Art Publishing Company an album with some capital copies of Royal Academy pictures. Messrs. Murray and Heath send some fine transparencies and stereoscopes. Mr. Beasley sends a revolving stereoscope with a fine collection of transparencies from his Indian negatives. Mr. Hare's ingenious and efficient changing box is exhibited; Mr. Tench's "baby-lens" and camera; a Scenograph, sent by the Sciopticon Company; a glass case containing many ingenious photographic appliances, but no name; and a very fine example of the Boudoir camera by Mr. Meagher, are also amongst the apparatus. Finally, there is a very ingenious camera exhibited by M. Jonte, of Paris, possessing many novel features. To Herr Warnerke, who has seen the instrument in Paris, we are indebted for the following description of it. He says:—"This is a camera possessing all the attributes of the best apparatus, such as long range of focus (24 inches), swinging and sliding front; it is very easy put in order, no loose pieces being present. The apparatus has in the lower part a space filled with one dozen (8½ by 6 inch) plates. Each plate is enclosed in the very light wooden frame. There is no dark slide, but every and any plate at will, with its frame, can be raised by means of a rack and pinion mechanism, and put in the position corresponding with the surface of the ground focussing glass inside the camera, and lowered again after the exposure. This system, superseding the dark slide, with its shutter always struggling with wind, with inevitable holes admitting light and dust, is the most valuable improvement over the ordinary camera and changing box. This apparatus is also provided with automatic register. The apparatus can be used for wet plates, owing to the probability that wet plates inserted in the frame will keep in the wet condition a long time, because the air in the camera is not changed."

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CARBON PRINTING UPON GOLD OR SILVER PAPER.

M. **Geldmacher**, of Frankfort, says the *Bulletin Belge*, has been successful in producing very charming results by printing upon surfaces of the above description; and some time ago he exhibited two carbon prints, which were very remarkable indeed. They were pictures of two antique vases in gold and in silver, reproduced in their natural colours upon a black ground, and the way in which they were secured was the following:—

They were obtained by transferring a carbon image to gold or silver paper, prepared, first of all, to receive them by covering it with a thin film of gelatine. The image, shadows, and ground were produced upon bichromated gelatine, the gold or silver colour being provided by the mount when the image was transferred to it. The black background M. Geldermacher produces in a very ingenious manner. He first of all prints a very dark picture from his negative upon ordinary chloride of silver paper, and when he has obtained this he cuts it out, so as to form a screen. The design of the vase is accurately followed, and the outlines cut out either with a knife or a pair of scissors as may be most convenient.

This screen or mask he now puts over his negative in the same way precisely as if it were a vignette. The outlines of the mask must, of course, correspond exactly with the contours of the vase, and then upon the two is placed a piece of sensitized carbon tissue, which is printed by the aid of a photometer. The part taken from the middle of the silver print has in the meantime been permitted to print perfectly black, and is then fixed by means of gum to the exact place corresponding to the void; the surrounding vignette is then lifted, and the ground is exposed until it appears sufficiently printed.

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CHROMIC INKS.

As long ago as 1848, Professor F. Runge invented what he called a chromic ink, from its containing chromate of potash. His directions for its preparations, published at the time in *Dingler's Journal*, were as follows:—A decoction of logwood is first made in the proportion of 10 to 80; that is, 10 lbs of logwood is boiled with enough water to produce 80 lbs of the decoction. To 1,000 parts of this logwood extract, when cold, is added one part of yellow chromate of potash, stirring rapidly. It is ready for use at once. Gum and other additions are injurious, he says, to this ink.

The following year W. Stein proposed an improvement on Runge's ink, saying that the great fault of this ink was that it soon became thick, like sour milk. This he overcame by adding four grains of corrosive sublimate to each bottle. This would restore thick ink to its pristine quality, and improve its colour, changing it from deep indigo blue to pure black.

In 1867, C. Puscher described a new ink similar to the above, made as follows:—Boil 10 ounces of logwood in 20 ounces of water, then boil again in 20 ounces more of water, and mix the two decoctions; add 2 ounces of chrome alum, and boil another quarter of an hour. One ounce of gum arabic is added, and we have 25 ounces of deep black ink.

Böttger says that a simple method of preventing gelatinizing in chromic ink is to add to the water in which the extract is made some carbonate of soda. His method of operation is as follows:—Dissolve 15 parts of extract of logwood in 1,000 parts of distilled water to which four parts of carbonate of soda has been added at boiling heat, and add one part of yellow chromate of potash dissolved in a little water.—*Scientific American.*

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Correspondence.

SALE OF PHOTOGRAPHS IN THE EXHIBITION.

Sir,—Will you allow me to make a suggestion to the authorities of the Photographic Society, which may not be too late for this year, and may at all events be useful another year.

Exhibitors are always put to a certain cost in sending contributions. Besides framing, there is the cost of carriage to and from the Exhibition. My suggestion is that facilities for the sale of the specimens should be afforded. Many country photographers having other copies would be willing to sell their exhibits at a reasonable rate rather than pay the cost of carriage home and the risks involved in carriage, and many photographers and others in London would be glad to purchase fine photographs on easy terms. What an auction sale might be secured the last night of the Exhibition, if such a thing were possible!—Yours truly, "Verbum Sap. Sat."

UNAUTHORIZED EXHIBITION OF PHOTOGRAPHS.

My Dear Sir,—I see in the News of the 29th Sept., just to hand, that some old prints of mine found their way to the late Photographic Exhibition in London, and this without my knowledge or consent.

Allow me to protest against this, and to suggest that in future a written application from the producer, or person authorised by him, should accompany all prints sent in for exhibition, and that none be admitted unless so accompanied.

Amateurs in general are not over careful of the way in which their prints are washed, and I myself have frequently been contented with a jug or two of water poured over them in a hand-basin. Now, how is it possible that such prints, after long keeping, can compete successfully (however much attention may have been bestowed on the manipulation of the negatives from which they were taken) with others fresh from the printer's hands? I am quite unaware to whom I owe the honour of having been represented at the late exhibition, and I write with no desire of causing annoyance when I feel convinced that none was intended me, but simply as a protest against the fact of photographs being exhibited by any one without the knowledge and consent of their producer. The abuse to which such a system might lend itself is too apparent to require my saying any more on the subject.—Believe me to be faithfully yours,

Madeira, October 28th. R. Manners Gordon.

Proceedings of Societies.

Edinburgh Photographic Society.

The seventeenth annual general meeting of this Society was held in 5, St. Andrew Square, on the evening of Wednesday, Nov. 1st, the President, Dr. Thomson, in the chair.

The minutes of last general and ordinary meetings were read and approved; and Messrs. S. E. Palmer and S. Tomkin were admitted ordinary members.

The Secretary then read the following report:—

Annual Report.

"Your Council, in reporting on the state of the Society at the close of this the sixteenth session, have pleasure in calling the attention of the members to its still increasing prosperity.

"There have been held during the session (in all) eighteen meetings—three popular evenings, three out-door, two special, nine ordinary, and the annual excursion—the business transacted at which has been as follows:—

"*Popular Meetings.*—First. A series of views illustrating Paris before and after the war, furnished by Lieutenant Gilbert, with descriptive lecture by Baillie Marshall; second, a series of views, work of the members, with descriptive lecture by Dr. Nicol; third, selection of pictures of the animals at the Zoological Gardens, London, interspersed with Indian scenery, kindly lent by Mr. York, of London, with descriptive lecture by Dr. Nicol.

"*Out-door.*—These were held at Craigie Hall, Winton Castle, and Hatton House; at all of which good photographic work was done.

"*Ordinary Meetings.*—At these meetings the following papers were read:—First. 'Exhibitions a Stimulus to Advance True Progress in Art Photography,' by Mr. Asher. Second. 'The Progessive Results of the Past Session,' by Dr. Nicol. Third. 'Enlarging and Enlarging Processes,' by Mr. Geo. Croughton, of Lowestoft. Fourth. 'A Short Tour with the Camera in Belgium,' by Mr. John Lessels. Fifth. 'Experiences in Working Gelatino-Bromide Emulsion Plates,' by Rev. H. J. Palmer, of Birkenhead. Sixth. 'Carbon Printing, with Practical Demonstrations,' by Mr. J. G. Tnuuy. Seventh. 'Small Scale Maps for Tourists,' by Mr. R. H. Bow. Eighth. 'Further Notes on the Effects of Light on Pigments,' by Mr. R. H. Bow. Ninth. 'Experiences in Working Emulsion Plates,' by Messrs. Turnbull and Mathison. Tenth. 'What should be done to make the Exhibition a Success,' by W. H. Davies.

"There were exhibited at the previous meetings the following pictures and apparatus:—

"A series of pictures the work of members; a new photographic tent, by M. Bainbridge, of Bernard Castle; a photographic curiosity, by Mr. E. W. Dallas.

"Your council think it right to state here that, in addition to the above, they have held fully a dozen meetings in connection with the forthcoming exhibition.

"Three distributions of pictures were made during the session, contributed by Messrs. Mathison, Crighton, Sinclair, and Yerbury. A donation of a number of pictures from gelatine plates was received from Mr. Kennett through Messrs. Ross and Pringle, for the Society's album.

"Your council, in calling attention to the business transacted during the year, desire to impress upon the members that the contribution of papers, or other matter, at the ordinary meetings is alone that upon which the Society can rely for preserving the status which it has always held, and urge the members to strengthen their hands in this direction.

"With reference to the Popular Evenings, your council believe they have been decidedly successful; although they do not directly minister to the ordinary meetings by which the Society must live, they help greatly to maintain and increase its popularity.

"Through death and resignation the Society has lost thirty-one members, and as thirty have been added to the roll, the membership is now 273.

"During the session your council have had exceptionally hard work in connection with the exhibition about to be held. It is to be on a scale never before attempted by any provincial society, and under circumstances the most favourable for a successful exhibition, the use of the Royal National Academy Galleries having been granted by the Lords of Her Majesty's Treasury for this purpose. Your council have reason to expect the exhibition will reflect much credit upon the Society, while at the same time it may do much to give a new impetus to photography in our midst.

"In conclusion, your council have to congratulate the Society on its prosperous financial position, as will be evidenced by the treasurer's report, and trust that the next session will be equally prosperous."

The Treasurer next read his report, which was highly satisfactory, and showed a balance in favour of the Society of £36 19s. 3d. as against £13 10s. last year and a balance on the wrong side in 1874. Both reports were adopted, and the Treasurer heartily congratulated on his financial success.

The members then proceeded with the election of office-bearers and council, and the following appointments were carried by acclamation:—

President—John Lessels.

Vice President, Junior—George A. Panton.

Treasurer—Colin Sinclair.

Hon. Secretary—Alex. Mathison, 7, Arthur Street.

Corresponding Secretary and Lecturer—Dr. John Nicol, 16, Warriston Crescent.

Auditor—A. T. Niven

Councillors, in room of those retiring by rotation, and removed to office—Dr. Thomson and Messrs. Thomas Pringle, E. R. Yerbury, J. R. Crighton, W. H. Davies, J. Annan, F. G. Stoddart, and J. E. Vernon.

Mr. Dobbie, in moving a vote of thanks to the office-bearers, said he was sure that he might speak for every member of the Society when he said, that those on whose shoulders the burden of the work lay deserved the greatest praise for the way in which it had been done during the past year. It was difficult to particularise where all had done so well. The gentle yet dignified suavity of the President had made it always a pleasure to sit under his rule. The zeal and energy of the Secretary had carried him through much arduous work, and the way in which he had devoted himself to the duties of the office had met with universal approval; while the fact that during the Treasurer's tenure of office the Society had risen from practical insolvency to a state of affluence spoke with no uncertain sound of the way in which his work had been done. He could not help feeling that it was a matter for regret that men so eminently fitted for the work of the Society, and with whom all who were brought into contact wrought so harmoniously, were retiring from office. although it was no doubt gratifying that they would still have their services as members of council. He had much pleasure in proposing a hearty vote of thanks to those gentlemen for their valuable services.

The proposal was carried by acclamation.

Mr Crighton agreed with every word that Mr. Dobbie had said, and, although not privileged to be behind the scenes, he was quite certain that from the way in which the business of the Society had been managed, the "rank and file" had efficiently responded to the officers in command. He therefore had much pleasure in moving the thanks of the Society to the members of council.

The President, while appreciating and heartily thanking the members for the compliments which had been showered on him, said that the eulogy was much beyond his deserts. While he was free to confess that he had all along tried to do his duty to the best of his ability, he gladly took advantage of the opportunity of expressing his obligations to the other office-bearers for the uniform kindness which they had shown, and the support and assistance that had always been so freely given to him. He also thanked the members generally for the courtesy with which he had been treated, and the forbearance with which his many shortcomings had been met. This had enabled him to discharge the duties of the office with pleasure to himself, and he would retire with satisfaction in the knowledge that the chair would be filled by one so well qualified as Mr. Lessels undoubtedly was for the work.

The following questions were found in the box:—

Given—α. Subject unsteady, necessitating a short exposure to secure sharpness.

Given—β. Circumstances necessitating a stop to secure sharpness and consequent prolongation of pose.

Query—Which will be the wisest thing:—(1) Omit the stop. or (2) use stop and give long exposé?

This elicited a good deal of discussion, the outcome of which was that under the circumstances a compromise only could be made; the want of sharpness from too large a stop would certainly be much less than that caused by unsteadiness of the object; the omission of the stop was to be advised. The meeting thereafter adjourned.

Annual Supper.

The annual supper was held on Friday evening in the Albert Hotel, and was more than usually well attended. The newly elected president being still on the Continent, the chair was occupied by the senior vice-president, Dr. Sidey, Dr. John Nicol doing duty as croupier.

After full justice had been done to the supper, admirably purveyed by Mr. Robertson,

The Chairman commenced the proceedings with the loyal and patriotic toasts usual on such occasions, which were, of course, enthusiastically responded to. In giving the toast of the evening, "Prosperity to the Edinburgh Photographic Society," he said the members had good reason to congratulate themselves on the present position of the Society. It was now in its seventeenth year, undiminished in popularity, its membership larger than at any former period, and in possession of a substantial balance at its bankers. This was followed by "Success to the Exhibition," "Kindred Societies," "Photographic Literature," &c., &c., all of which were very heartily responded to.

The toasts were interspersed with some excellent songs and recitations, and the proceedings brought to a close with "Auld Lang Syne," a little before eleven o'clock.

Bristol and West of England Amateur Photographi Association.

The ordinary monthly meeting of this Society was held on Wednesday evening, 1st inst., Mr. W. Walker Stoddart, F.C.S., F.G.S. in the chair. The meeting, unfortunately, taking place on the day of the general municipal elections, was small, many of the members being away on civic matters.

The minutes of the former and preliminary meeting having been read by the Secretary (Mr. H Daniel), Mr. Webbor, of Bristol, was elected as an ordinary member, and Mr. Manfield of Northampton, as a corresponding member.

The Secretary having read some letters from absent members expressing regret at their inability to attend,

Mr. E Brightman exhibited a transparency taken upon the sensitive tissue of Mr. Warnerke, which was certainly to all appearances perfect. He commented upon the mode of development and extreme lightness and convenience of the system.

The President, having examined it, remarked upon the toughness of the film, and demonstrated the fact that it required considerable force to break it, and drew the attention of those present to the great convenience of having the tissue in such convenient form, and compared it with the large excess of weight in as many sheets of glass as layers of tissue in a block.

The Secretary having arranged for some of the papers that would be read during the session, after some further discussion upon various subjects the proceedings terminated.

Liverpool Amateur Photographic Association.

The monthly meeting of this association was held on Thursday evening, the 26th ult., at the Free Library, William Brown Street, the President, Mr. W. Atkins, in the chair.

The minutes of the previous meeting were read and confirmed, and Mr. T. Bruce and Mr. E. Shannon were elected members of the association.

The Rev. H. J. Palmer showed a number of portraits taken with gelatine plates, which were exceedingly successful.

Mr. W. H. Kirkby said that he had made some further experiments with wet emulsion plates, using as a preservative albumen and glycerine. The plates which he handed round had been kept eleven hours between the time of preparation and development. The exposure was half a minute, being the same as he should have given with a wet plate with the same stop. There was no difficulty in the development, and no stains or drying marks, the plates keeping moist.

Mr. Wharmby had noticed that some complaints had been made in the photographic journals about the deficiency of half-tone and density in the emulsion process. He found no difficulty in obtaining both half-tone and density, and handed round a number of negatives showing no want of either.

Some negatives produced by the Rev. Canon Beechey's process were also exhibited, and pronounced by the President to be very satisfactory.

Mr. J. H. T. Ellerbeck showed some transparencies toned with chloride of palladium. He, however, thought it an expensive method of toning, owing to the quick decomposition of the palladium. He (Mr. Ellerbeck) also alluded to the advantages gained by using an actinometer during the exposure of dry plates, and stated that he found in taking a view of a dark glen, that it took fifteen times as long to give one tint of the actinometer there than it did in the open, and by giving that difference to the dry plate he found he had given the right exposure, while if he had only guessed the strength of the light the plate would have been much under-exposed.

Some fine examples of burnt-in photo-enamels were exhibited. These had been kindly lent by Mr. W. T. Watson, of Hull.

The Secretary gave a description of the method by which these enamels were produced, and advocated their production for the decoration of vases, &c., in preference to the fancy portraits generally used for their ornamentation. If such fancy prices were paid for an old china plate, how much more valuable a plate or china ornament ought to be if it had on it a family portrait or a favourite view or residence. That these could be obtained in that form the excellent examples before them would show.

The meeting was shortly afterwards adjourned.

Photographic Section of the American Institute.*

The usual meeting was held in the institute, Mr. H. J. Newbury, president, in the chair. After some routine proceedings, Dr. A. Ott read a paper on "Carbon Printing" (see page). After the examination of some specimens,

The Secretary inquired if there was any difficulty in getting the paper in contact with the glass?

Dr. Ott said there was no trouble in this respect; the paper is rigid at first, but as soon as it has been sensitized it can be laid flat on the glass. These pictures were made without the use of the actinometer, which is only necessary with the inexperienced.

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* *Anthony's Bulletin.*

The President wished to know if the pigment did not require a long exposure?

Dr. Ott replied that it is from three to five times more sensitive than albumen paper. If the paper is of the right quality and properly prepared there is no difficulty whatever in working it.

The President asked how long a time it would take to complete pictures, from the taking of the negative to all the succeeding processes, as compared with silver?

Dr. Ott stated that if the picture is taken in the morning, it can be delivered in the afternoon. Warm and cold water is all that is required. The only operation that requires skill is the squeegeeing of the paper, so that no air-bubbles remain. Both the papers are left in cold water, and then immersed in warm water. Double transferring, of course, takes more time. Pictures can be transferred on glass, on wood, or leather. Glass pictures are quite general in Germany. The photographers there have them displayed in their windows. Pigment prints in general are retouched the same as the ordinary silver pictures. The price of a roll of the paper, such as I have here, is twelve francs in Europe—a little over two and a-half dollars here. The roll is fifteen feet long and about thirty inches wide.

Dr. M. N. Miller said that Mr. Lambert stated last spring that operators should prepare their own paper.

Dr. Ott believed that there was, on the contrary, much difficulty in operators preparing their own paper. Great care must be exercised to have the ingredients properly mixed; durable and stable pigments can only be used, and then the layer must be used perfectly uniform. The whole process must be carried on in a cool place.

The President inquired if the paper should not be kept in a cool place?

Dr. Ott replied, yes; but care must be taken that it does not become mouldy. Gelatine and pigment are the principal ingredients of the covering of this paper.

Dr. Miller said that he had some sensitized paper on which the image could not be developed; it seemed as insensitive as sheet iron.

Dr. Ott stated that the gelatine may get damp, but will not spoil on that account; there is some carbolic acid in it, which will preserve it from moulding. The colour in this paper is only two per cent. of lamp black.

Dr. Miller remarked that the difficulty is in the transferring, the same as Albert had when he first commenced transferring. Nearly half came off. But the paper he spoke of as having been used was such that none of it could be made to come off.

Mr. D. C. Chapman said that if the negative used is perfectly black, it may be exposed for a month, and no impression could be made through it.

The Secretary asked if these pictures were made here?

Dr. Ott answered, yes; he made them all here himself. The paper is never sensitized when it is made: that is done afterwards. By means of the pigment process pictures are also made in colours.

Mr. Chapman inquired what change takes place when the gelatine is decomposed by electricity during a thunderstorm?

Dr. Ott said he could not well answer that, but would infer it to be the same as when milk is spoiled from a similar cause.

The President asked, What is the effect on the paper?

Dr. Ott said that the paper looks just the same as before, but it does not act so; but decomposition from this cause very rarely happens.

Mr. E. Bierstadt remarked that milk turns sour very quickly during a thunderstorm, and the action is just the same if the milk is placed in a sealed glass vessel.

Mr. Chapman said that whether it was the ozone, the vibrations, or the electricity that produces this change we do not know.

Mr. Chisholm stated that if a current of electricity is passed through fresh eggs they will be immediately spoiled.

The Secretary asked Dr. Ott if he could give an approximate price these pictures would cost the producer?

Dr. Ott replied that photographers in Europe charge more for the carbon pictures than the albumen, although the cost of the paper is just the same, and there is less work to be done, and no gold or silver solutions to be used. In Europe the people would not be likely to take them if the price was the same as ordinary photographs. A single or double transfer, a right or a left, can be made from the same negatives, just as you wish; and it can be enlarged if desirable. In comparison with the ordinary negative, a carbon picture on glass will be much finer, the molecules of lampblack being much finer than those of silver. It is very easy to colour pictures on this paper, as it has no albumen on it. The picture is placed in a solution of alum, which hardens the gelatine so that it does not come off, and it does not repel the water. If the picture is over-exposed, it can be brought back with warm water; and in particular places, if desired, it can be made light by a jet of water with the wash bottle.

The President said this carbon process has been worked up to a great degree of success in Europe, but in this country it has not been so. Several parties have worked at it for some time, but it has now been entirely abandoned. There was a gentleman here who worked it very enthusiastically and perseveringly some years ago; but he finally gave it up. Last winter a gentleman by the name of Todd exhibited some of his work here, and it seemed that his specimens were finer than he had ever before seen; and he was in hopes that Mr. Todd would introduce the process, as he promised to do. He was going to start in this city or suburbs, and take the negatives or photographs from the operators here, and furnish them with prints such as the specimens he exhibited. Some of his enlargements were very fine. He had not seen Mr. Todd since, but he understood that a building for working the process was erected at Jersey City or at Piermont; but whether Mr. Todd has succeeded, or has given it up, he did not know; but he hoped that Dr. Ott would fully succeed in establishing it among us.

The Secretary said that the gentleman whom the president first alluded to was named Drummond; he worked Swan's process, and in some correspondence he had with Mr. Swan he stated to him that there was some difficulty with every one who tried to work his process here. He replied that it worked well in Europe, and he proposed to come out here and see what the trouble was. Since then we have had probably a dozen who have tried to introduce carbon work here, and every attempt has been a failure. Mr. Todd exhibited some very beautiful specimens to us, but there seems to be some difficulty in working carbon tissue practically. Now and then we hear of its working well in some out-of-the-way place, but nothing further. Now we have evidence here that it has worked well in our climate; and if Dr. Ott will furnish us what he has promised, we will be able to do something in that line.

Talk in the Studio.

Simple Rules for Mounting and Touching Photo-Pictures.—This is the title of a little tractate just issued by Mr. Harding Warner, for the special advantage of amateurs. It contains clear instructions for mounting prints in albums, scrap-books, or on boards, and also for touching-out defects after the prints are mounted.

Masks and Discs.—We have been favoured by Messrs. Mann and Fursman with a series of their examples of masks and discs for aiding in fancy printing. They are cut from enamelled black paper, or from a non-actinic yellow paper, at the pleasure of the photographer. The masks consist of every size and shape—square, dome, circular, and oval—and discs of similar sizes and shapes. The shapes are true and very graceful proportions, and are admirably clean and sharp-cut. Nothing could be better for their purpose.

New Secretary to the Arundel Society.—This Society, the chief aim of which, as our readers know, is to copy and circulate copies of the works of great masters, by photography and other means, recently elected a new Secretary, in place of the late Mr. Maynard. Mr. Stephen Thompson, who had been regarded as a certain candidate, lost the position by one vote, Mr. Lambe Price gaining the election.

American Portraitists.—Here is a tribute to American photographers, appearing in the *Hornet*. The Editor has recently visited the States, and is favourably impressed by his visit:—"If the American ladies are pretty, the American photographers make them still prettier. To be photographed in England, as a rule, is to be libelled. The operation is a mechanical one; you are posed with a poker down your back; the shortcomings of your features are exaggerated; and your complexion is disguised. There are exceptions to every rule, and some of the English photographers are capable and artistic; but all the American photographs are good, and many of them are superior to those of England and France. Sarony, of New York, has dignified photography into an art. He is the genius of the camera. Many of his works are poems —they are all pictures. With the eye of an artist he at once detects the best view of his subject, and his manipulation is perfect. He gets into his pictures what the great English amateur, Mr. R. Crawshay, achieves—atmosphere But what a climate the American has for his work! New York has an Italian sky; in the Indian summer the atmosphere is clear, bright, elastic, without even the suspicion of mist or cloud. If you want to see a gallery of female beauty, go to Sarony's. 'Mora,' whose works are now seen in London, was a pupil, but he has only caught the trick of his master; he has neither his quality, his poetry, nor his artistic finish. Next to Sarony in NewYork, for truth of portraiture and excellence of finish, is Mr. J. O'Neil, of Broadway, who is doing some very fine cabinet pictures. His full-length figures are studies, and his successes with children's portraits are quite remarkable. In Sarony's album the most recent signatures are Wilkie Collins, William Black, and Martin Tupper. The latter gentleman has written an impromptu, which he has taken care to explain is the work of the moment, even, as he says, a 'part of my conversation with Mr. Sarony.' On the next page a new comer has written the following:—

Good Bye.

And they drunk at parting waters strong
That fired their hearts but not their lyres.
—*Old Play.*

I cannot write impromptu,
And to-day my muse is muddled,
For drinking many parting drinks
Last night this boy was fuddled.
But here's a farewell toast,
Though we drink it in a pony,
Here's luck, my merry friend, to thee,
My bully boy Sarony.

'A pony' of brandy in the States is equivalent to 'a go' in England."

On the Use of Glycerine.—As glycerine is used more and more in photography, I think it useful to reproduce here a table of the solubility of divers photographic agents in this fluid. One hundred and twenty cubic centimetres (four fluid ounces) of ordinary gelatine will dissolve:—

Alum	40 grammes	(617 grains)
Carbonate of ammonium	20 ,,	(308 ,;)
Chloride of ammonium	20 ,,	(308 ,,)
Sulphate of copper ...	30 ,,	(463 ,,)
Sulphate of iron ...	25 ,,	(386 ,,)
Bichloride of mercury ...	7·50 ,,	(125 ,,)
Iodine	1·90 ,,	(30 ,,)
Cyanide of potassium ...	32 ,,	(494 ,,)
Bromide of potassium ...	25 ,,	(386 ,,)
Iodide of potassium ...	40 ,,	(617 ,,)
Morphia	0·45 ,,	(7 ,,)
Acetate of morphia ...	20 ,,	(308 ,,)
Acetate of lead	20 ,,	(308 ,,)
Chloride of zinc ...	50 ,,	(771 ,,)
Iodide of zinc	40 ,,	(617 ,,)

These figures are approximations, but will suffice as a guide in the use of glycerine in place of water for dissolving the above substances.—*Dr. Phipson.*

To Correspondents.

F. H. H.—It is difficult to remove silver stains from woollen fabrics without injuring the colour. The application first of tincture of iodine, and then of cyanide, is the most efficient method. 2. If a gas stove be placed in a dark room, or, indeed, any room, it must have a flue to carry off the products of combustion into the open air, otherwise the evils you describe, and injury to the health, will ensue. George's Gas Calorigen is quite safe.

Y. M. A.—We have very repeatedly given details of the mode of enamelling prints. A repetition of the instructions would occupy too much space for an answer in this column. Consulting our back volumes or Year-Books you will obtain full information. M. Piquepe's recently published little work will also give you details.

C. B. C.—There must have been some mistake. There should be no difficulty in obtaining ferridcyanide of potassium of any photographic chemist, and of most operative chemists. Hopkin and Williams have generally supplied that we have used.

E. G. C.—One of the best aids to the preparation of a paper or lecture on photography generally, its history and practice, is an article which appeared in the *British Quarterly Review* for October, 1866. Of course, the progress of the last few years would require adding; but that chiefly consists in the development of the carbon process, and some modes of photo-mechanical printing. Or, if you have the volumes of the News, you may easily compile a paper from its pages. The number of the *Quarterly Review* named will cost you six shillings. It is published by Jackson, Walford, and Hodder, of Paternoster Row. 2. Landscapists adopt different plans for placing names on negatives. A very simple method for securing letters in white is to write the lettering with some opaque pigment, reversed, of course, on the corner of the negative.

Belmont.—Evaporating dishes of suitable porcelain, which will stand fire, answer best. Iron, if well enamelled inside, may be used; but, of course, contact with the metal would be fatal.

Vertuoso.—The *South London Press* contains the article in question, which was published on the 9th of last September. It is not difficult to pick up a second-hand copy of "Lavater": but the only mode to get it, is to look out for him in second-hand booksellers' catalogues, or on their stalls.

E. Williams.—The glass room you propose must, of course, be somewhat of an experiment, the success of which can only be determined satisfactorily by practical trial. On the whole, we think it promises well. But we should prefer the two lights meeting in a ridge, like Mr. Smart's, rather than have the space divided into three lights, one of which, being a direct front light, will, we fear, have a tendency to flatten the image. Thanks for your experience with baryta, which we will give in another column.

A. Borland.—Thanks. We shall have pleasure in using the amusing morceau.

Frames.—The "Carver and Gilders' Guide," from which we have quoted, gives details of the gilding processes generally; and these seem to be practical. Judging from its instructions for operations with which we are familiar, we should say without hesitation that the book is a practical one throughout.

S. V.—Of course 120 ounces of crystals could not be dissolved in ten ounces of water. 120 ounces is a misprint for 120 grains.

Banquo.—The use of nitrate of baryta in the bath as a cure for pinholes has generally been found successful; but we have heard from many correspondents where it has not been efficient. The whole question of pinholes is a very troublesome one, as they may arise from so many sources. The most obvious and easily remedied causes are dust in the slide or in the nitrate bath; but the most probable cause is excess of iodide of silver in the nitrate bath, and as iodide of silver is less soluble in hot solutions than in cold solutions, the bath is apt from this cause to be turbid in hot weather, and pinholes ensue. The remedy is to dilute the bath with twice its bulk, filter, and then add sufficient nitrate of silver to make up the bath again to the proper strength. In intensifying, be content to intensify slowly, and add very little nitrate of silver to the intensifying solution, as rapidly reducing silver on the image frequently produces pinholes.

Chemicus.—Protochloride of iron will convert gun-cotton into common cotton. 2. There are various methods of making a plain paper print transparent. Either wax or varnish will answer; but if you require it to be attached to glass, the use of a varnish will answer your purpose best. The print should first be soaked in hot water to remove the size as completely as possible. It may then be treated either with mastic varnish, or a varnish made by dissolving Canada balsam in turpentine. A strong spirit varnish might be used, but as it dries rapidly, the manipulation is not so easy. The print should be saturated with varnish, and the glass surface coated with varnish, and the two brought together carefully so as to exclude air-bubbles.

J. M. B.—In making a new bath, we always try a picture first of all, and then proceed, if necessary, to neutralize, or sun, or otherwise deal with it as may be suggested by the indications given. 3. Negatives developed with the gelatino-iron solution may, if necessary, be intensified with pyro and silver in the usual way.

R. M.—Glycerine is sometimes added to horny collodion with advantage, and, so far as we know, the addition of a little glycerine to the collodion does not injure the bath; but it will, of course, be wise to make such addition cautiously, so as to avoid excess. It has been found very useful in modifying the effects of a horny, repellent collodion, and the contingent matt silver stains.

Infant Hercules.—We have received a portrait of a baby, a perfect Hercules in his proportions—the portrait surrounded by a pretty lace border photo. No note or communication of any kind accompanied the photograph.

An article, "Further Hints on Character in Portraiture," and some other articles in type, are compelled to stand over until next week.

Several correspondents in our next.

The Photographic News, November 17, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography in the Theatres—A New Use for Gun-cotton—Ornamentation of Glass.

Photography in the Theatres.—There is scarcely any theatre in London which has not at some time or other made use of photography in elaborating scenery and costumes. One of the first applications, which many of our readers may still remember, was the painting of the act drop at Drury Lane theatre by the aid of a series of photographs—or, rather. Daguerreotypes, we believe they were—taken at Mr. Mayall's photographic studio in Regent Street. In this case the artist desired to secure the charming effect exhibited by new satin when it is first unfolded and allowed to fall to the ground with all its beautiful gloss and sheen enhanced by chance creases and folds. Mr. Telbin, the well-known scenic artist, conceived the idea of having pieces of satin in this unstudied condition reproduced by photography, and from the plates secured he painted the beautiful act drop which has done duty at Old Drury for so many years. At the Haymarket, also, the assistance of photography has been called in for painting scenery, and Mr. O'Connor, the scenic artist who has been so long connected with the house, is in the habit of employing transparencies which are reflected by means of a lantern upon a screen, and is thus enabled to obtain a very clear idea of any object he desires to transfer to canvas. As the tendency is at present, with regard to scenery at our theatres, to paint from nature and "localise" the action of a piece, photography is becoming more and more important to the scenic artist. A case in point will illustrate what we mean. At the Gaiety Theatre it is the intention this Christmas to produce an extravaganza or burlesque on the subject of William Tell, and to add to the interest of the piece, it is intended not merely to paint some fantastic scene or other, to represent "the Alps at Moonlight" or "the Home of Tell among the Glaciers," but to reproduce some well known spot in Switzerland were Tell was supposed to have lived. We say supposed, for William Tell, and Gessler, and other characters so well known in story, have long ago been proved to belong to the realms of mythology. According to tradition, however, Tell lived by the Lake of Lucerne, and Tell's chapel on those waters, and Tell's rock near Kussnacht, are well known to tourists, as also the town of Altdorf, where the feat of shooting an apple from his son's head was attempted by the Swiss patriot. Altdorf is now known as the first place of importance that the traveller passes through after he has landed at Fluelen and is on his way to Italy over the St. Gotthardt Pass. It contains a statue of Tell, cross-bow in hand, of heroic size, which helps to keep up the delusion that the legend is not a legend after all. On the mountains just above Altdorf, and not three miles from the lake, a pretty hamlet is to be found called Burgeln, and to this has been awarded the honour of having been the birthplace of Tell. Naturally, therefore, in dealing with William Tell and his times upon the stage, it is but correct to associate with his doings the scenes where his life was passed, and accordingly the management of the Gaiety desires as far as possible to represent truth in the scenery, if it does not exist among the *dramatis personæ*. Mr. William England has kindly placed at disposal some of his well-known photographic sketches of Altdorf and the neighbourhood, and these will form the groundwork of the artists' labours. The market-place at Altdorf, with the statue in question, will probably form one of the leading features, so that visitors may not only be amused at the dramatic portion of the entertainment, but, if they are travellers, they may derive enjoyment from seeing spots represented with which they are familiar. As we have said, the desire to "localize" scenery is every day becoming more marked in our theatres, and, as a matter of course, therefore, photography is becoming more and more valuable to the scenic artist. There is no reason, indeed, if they employed a strong light—such as the oxy-hydrogen lamp, for instance—why a transparent photograph could not be reflected upon a canvas screen at the back of the stage, of the extraordinary dimensions required by the scene painter, who could then trace in the outline at once, as well as put in many of the effects. At the Polytechnic many of Mr. England's views have been shown of dimensions quite large enough for such a purpose, and the pictures, thus enlarged to pretty well the original size, present a most striking and natural appearance to the audience. One scene in particular, we remember, a representation of a square at Rouen with a statue of Joan of Arc, which appeared so life-like and real, that one almost fancies oneself one of the group of spectators in the square, looking at the monument. With such a picture before his eyes and in his studio, a painter could not go far wrong, and would be capable, no doubt, with very little trouble, of producing such a scene at once satisfactory to himself as artist, and to the public who desire to see a certain familiar spot represented to them.

A New Use for Gun-cotton.—We are used to all sorts of applications of pyroxyline or gun-cotton, but one which has been recently suggested will, we think, prove novel both to the chemist and photographer. M. E. Jacquemin suggests its employment for the detection of colouring matter in wines, which, we fear, are now-a-days added very extensively. Two colours known as fuchsine and archil are said to be both used by the wine producer when the vintage fails to do what is expected of it. A wad of gun-cotton, the staler the better, heated for a few moments with a little of the wine to be tested, becomes dyed with the latter (the colour not being removed by washing) if there is anything beyond the natural colouring of the wines present. If fuchsine and archil are contained in the wine, they will at once dye the wad of gun-cotton. They may be differentiated by moistening the dyed wad with ammonia, which changes the archil to violet, and slowly bleaches the fuchsine. In using this test to detect foreign colouring matter, it is better to employ gun-cotton that is undergoing change, it seems, than that which is new and pure. M. Jacquemin reports that nearly all substances used for artificially colouring wines fix themselves upon gun-cotton sufficiently well for conclusions to be drawn as to their nature by the changes which they undergo on treatment with ammonia. Altogether, therefore, the test is one that is well worth knowing, especially to photographers and others who know enough about chemistry to conduct the simple experiment.

Ornamentation upon Glass.—Photographers hardly understand to what uses hydrofluoric acid may be put in the decoration of glass, articles thus produced having a better appearance than those secured by the ordinary engraving process. M. Siegwart, in the *Polytechnische Journal*, points out that the best decorations are obtained by etching several portions of the glass surface with ammonium fluoride slightly acidified with acetic acid. To secure the ice-like lustre which is now so often seen upon glass objects, the glass surface is in the first place covered with small shot, and then dilute hydrofluoric acid is poured over it. M. Siegwart also gives a method of printing photographs on glass. He directs the operator, first of all, to secure an image by means of gum, honey, &c., and bichromate of potash, and dusting this hygroscopic picture with red lead powder. This red lead image is then burnt in, and the more soluble lead glass thus obtained is treated with concentrated nitric acid, whereby a dull white image is produced, which may be viewed as a transparency.

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IMPROVISED GAS FURNACE.

Mr. Edward J. Hardman, F.C.S., writing to the *Chemical News*, describes some improvised apparatus, which those of our readers who reduce their own residues may find useful. He says :—

"The following short description of an extremely effective, cheap, and cleanly substitute for crucible jackets, &c., may be useful, especially to those who, like myself, have occasion to shift their quarters often, and are obliged to work with a necessarily limited laboratory accommodation.

"The ordinary crucible jacket, being made of sheet-iron, has, in reality, but one use—to protect the flame from currents of air. The small concentration of heat which it affords may be regarded as nearly *nil*, since, from the nature of the material and its thinness, radiation takes place very freely.

"Another drawback it has is that it soon becomes rusty or coated with scale. It is not only dirty to handle, therefore, but also presents the inconvenience of dropping some of its scale into the crucible if not carefully manipulated. Then it is an awkward thing to pack, taking up a good deal of space, rusting everything it comes in contact with, and behaving, generally, in a disagreeable manner ; while, as it is not to be obtained in country towns, it may not be left behind.

"Now, an ordinary earthenware flower-pot answers the purpose in every respect. It is the proper shape, and, being made of a non-conducting material, it in a great measure prevents loss of heat from the burner. It is extremely cleanly to use ; and last, but not least, it can be procured in every town or village at the small cost of one halfpenny or so ; so that there is no necessity to cumber oneself with it when moving.

"The bottom of the flower-pot has a circular hole. This serves for the introduction of the Bunsen burner. As the supply of air would be insufficient otherwise, it will be necessary to enlarge the opening. This can be easily done with a knife, and I find it best to cut the aperture nearly in the form of a cross, and not too large. One or two trials will give the happy medium. A current of air is then obtained, which not only steadies the flame, but acts in some degree as a blast. The flower-pot may be supported in the ring of a retort stand, in the usual way. The chimney is a second flower-pot inverted. To support it the handiest way will be to make three S hooks of stout wire, and having passed the narrow end of the pot upward through the ring, fix the rim within the hooks caught on the ring, as in fig. 1.

"It will be found convenient to devote a small retort stand permanently to the purpose. The whole arrangement is shown in fig. 2.

"This will be very handy, as the upper part can be raised to any desired height, regulating the heat and draught ; or can be shifted from side to side, whenever it is desirable to inspect the progress of the operation going on.

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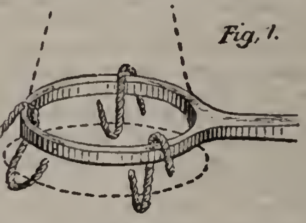

Fig. 1.

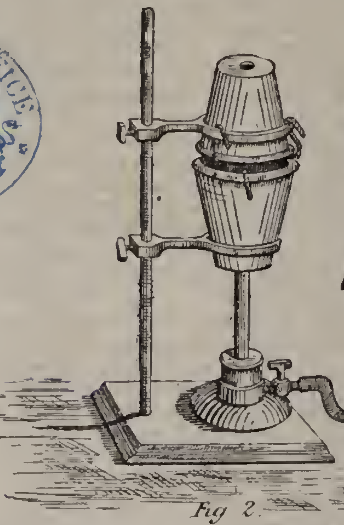

Fig 2.

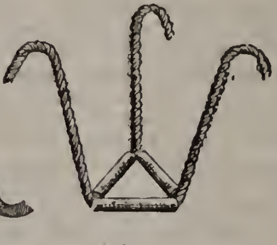

Fig. 3

"The apparatus acts admirably as a small gas furnace for crucible operations, such as the fusion of silicates with carbonate of soda—as in the analyses of rocks ; while for simple ignition of precipitates, it renders the flame of a common glass spirit-lamp most effective. The size of the flower-pot required will, of course, depend on that of the crucible and of the burner used. I find the smallest size, 3½ inches high and about 3 inches diameter at top (internal), most generally useful.

"The support for the crucible may be either a triangle of wire covered with pipe shank, the end of the wire being bent upwards and formed into hooks so as to hang on the edge of the flower-pot (fig. 3), or three pipe-covered wires suspended in the position of the ribs of a crucible jacket. The former is necessary for small crucibles.

"The flower-pot also makes an excellent lamp screen for steadying and concentrating the flame under evaporating basins, &c. ; of course a sufficient interval must be kept between the pot and the basin, else the light will be extinguished.

"A small flower-pot with wire gauze tied over the top is a very effective low temperature lamp when the gas is lighted below the gauze. If the gas is lighted above the gauze, we have a capital argand lamp, giving a large clear blue flame. In the latter case a common burner can be used, a consideration when Bunsen's are all temporarily occupied or not available.

"After a time the pots become cracked from the heat ; but as they are easily replaced this does not matter, and even when cracked, they will often hold out for a considerable time. Fireclay flower-pots, made rather thick, would, however, afford a really good, cheap, and portable furnace.

"It has just occurred to me that by placing the flower-pot inside another, just large enough to encase it, loss of heat by radiation would be effectually checked."

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CLEANLINESS IN PHOTOGRAPHY.

BY O. N. W. BALDWIN.*

Although there has been considerable said on the subject of cleanliness, I beg leave to argue that it cannot be too fully dwelt upon. We may take either branch of the photographic profession, and if there has not been strict observance of cleanliness, the (un-)finished picture will disclose the slothful neglect of the executor.

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* *Philadelphia Photographer.*

I have visited several galleries, and dirt and negligence seem to be the prevailing cause of so many failures; some claim the bath is out of order, some the collodion, and others similar complaints, but none have even hinted that dirt and carelessness were the least bit dangerous. Some galleries that I visited seemed to be more like a workshop than a photographic gallery where they expected lady customers daily.

Can any one build up a good trade or reputation as long as his rooms are filthy; his clothes shabby and glazed from head to foot with chemicals; his hands black as though he worked in a wagon shop; his work streaked, spotted, and stained, and, worst of all, filthy finger marks upon it? I am sure, and I think you will bear me out in the assertion, that carelessness and uncleanliness are the only true sources of streaky chemicals and dirty pictures.

There cannot certainly be any one that has worked at the business any length of time but what has a good set of formulæ, and if he is careful in preparing his chemicals and diligent in cleanliness, he will have but little trouble. In the first place, there is too little attention paid in keeping the person neat and clean. Then the rooms are dusty, and everything in confusion. Brother shadow-catchers, let us have a place for everything, and when once through using it, you have more time then to put it where it belongs than to wait till things get promiscuously mixed. Always before mixing any chemical, preparing plates, or making sittings, wash your hands, and wipe them dry on a clean towel. In preparing and albumenizing glass, the greatest care should be used, and all glass should be rinsed under a tap of running filtered water. Do not let the albumen run over on the back of the plate; if you do, your bath will soon get out of order, and you will not know how to remedy it. Do not leave your bath open while the plate is coating, and wonder why your chemicals fog. Do not flow on the plate enough developer to wash off all the silver, then be puzzled to know why the image is flat and inexpressive. Do not fix your negatives in cyanide strong enough to take out all the fine detail, then intensify with chloride of gold to bring back intensity and no detail. Do not slop your hypo. around on the floor, so that when it dries it will rise and settle in your chemicals, and you will be at your wit's ends to know what is the trouble.

Hypo is one of the most dangerous as well as the most useful things in photography. If you want to try an experiment, tone your prints in an old fixing dish; but I would advise you to vaccinate your prints first. Clean your negatives on both sides thoroughly before printing.

It would be well to look to your camera-tubes, and see that the lens is covered when not in use. Avoid raising dust in sweeping by sprinkling salt upon the carpet. In conclusion, I will mention there is nothing so disgusting to the observing public as negligence and filthiness in photography.

THE ACTION OF ALCOHOL UPON PRINTED CARBON TISSUE.

BY M. LEON VIDAL.*

If, after exposure to light, a sheet of pigment tissue is plunged into alcohol, and then allowed to dry before being submitted to the operation of development, it will be found that the image appears with much more intensity than if it had been tested in the ordinary manner. So that it is possible to reduce the period of exposure to about one-half by having recourse to this method; the alcohol being capable of employment either in the case of the single or double transfer process.

The action of the alcohol is to bring about a greater constriction of the gelatine, and to imprison more completely the half-tones. It is known that gelatine immersed in alcohol for a longer or shorter period becomes of a horny nature, so to speak; and it has, after such immersion, far less tendency to absorb water. The network of the material is more tightly drawn, and on development the properties of the clichés are better preserved.

On the other hand, again, exposed tissue, plunged into alcohol before development, becomes freed of a large quantity of the free bichromate, and it is possible, even after an exposure of much shorter duration than usual, to preserve the tissue for several days without its undergoing any alteration. These facts may not be of very great importance in practice under ordinary circumstances, but they are well worthy of note, because every detail added to our knowledge of the behaviour of bichromated gelatine is of value to the carbon printer, whether they relate to the tissue before or after development.

Another experiment of the same kind made upon bichromated gelatine after its exposure to light, with a view to making it useful in the phototype process, produced analogous results; but much more useful in the end, for, thanks to the immersion in alcohol, which precedes treatment in water, the image possesses greater stability, a matter of some importance, seeing that it has to be manipulated with a roller, and has also to be subjected to repeated washings, while, at the same time, as I have said, less exposure was necessary to bring about such a result.

In this case the plan of immersing the tissue after printing in alcohol is one of considerable importance, because it often happens that the insulated film loses very rapidly some portions of the half tones which are too superficially printed upon its surface.

The alcohol has no doubt the property in replacing the water which distends the network of the film of gelatine to draw it closer together, and thus to give greater solidity to the modification which has been brought about by exposure to light. It permits us to correct defects possessed by some kinds of gelatine which have not sufficient density.

I submit these observations to the attention of my estimable colleagues, in the conviction that they in their turn will impart any observations on the subject which they may have made, so as to enable me to complete the investigation of the subject which I am undertaking. There is not, I repeat, a single reaction or phenomenon, however slight, that should be passed over, because it is only by closely observing the rôle played by this organic substance, which has so much to do with our present photographic work, that we shall be able to carry on our labours satisfactorily.

PHOTOGRAPHY AT THE ROYAL CORNWALL POLYTECHNIC SOCIETY.

The forty-third report of the Royal Cornwall Polytechnic Society is to hand, and forms a good sized volume, chiefly consisting of the reports of the judges on a large number of artistic, industrial, and technological subjects. The report on the contributions to the photographic department, in which Messrs. W. N. Carne, R. Fox, T. Hart, and G. Lanyon were judges, runs as follows:—

"It is with feelings of great pleasure that the judges in this department report on the magnificent collection of photographs now exhibited, and to many of which they have had the honour of awarding medals They regret they could not, by the rules of the Society, extend the prizes.

"They would recommend the committee to revise the prize list for competitors before next year, in order more fully to meet the requirements of the rapid development of the art, as it is fast becoming not merely a chemical science, but a real fine art, requiring the highest artistic culture, as evidenced in such works as those exhibited by Colonel Stuart Wortley, Messrs. George Nesbitt, Chaffin and Sons, Robinson and Cherrill, A. and J. Bool, Lafosse, David Hedges, W. Nicholson, W. Brooks, Robert Crawshay, Garrett Cocking, and many others whose works are in the exhibition.

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* *Moniteur de la Photographie.*

"The first silver medal is awarded to Messrs. Chaffin and Sons, of Yeovil, for their Group (No. 749), taken direct, showing many high artistic qualities. It is the largest direct photograph (of figures) from one negative ever exhibited here. Messrs. Chaffin exhibit other works showing the same careful manipulation and good results.

"The second silver medal is awarded to Mr. George Nisbett, of Bournemouth, for his 'Portrait of a Young Lady' (No. 687). Mr. Nisbett exhibits ten photographic pictures, all showing that he possesses talents of a high order and has used them well. His picture, No. 682, 'She will Recover,' reminds one of the late Mr. O. G. Rejlander's exquisite art productions.

"A special first silver medal is also awarded to Colonel Stuart Wortley, for his collection of large studies of figures, which are very beautiful. They are powerful in light and shade, well graduated, and remind us of the works of Rubens, Rembrandt, and other old masters. He exhibits, also, a splendid collection of large instantaneous views—'What are the Wild Waves Saying?' being particularly successful; also the largest and best specimen of dry-plate photography we have ever seen.

"A special first silver medal is awarded to Mr. David Hedges, of Lytham, for his fine studies of animals (a difficult branch of the art), most successfully treated, particularly the horses in case No. 691.

"The first-class silver medal is awarded to Mr. W. Nicholson, of Ventnor, for his 'Bow Church,' taken direct. It is a view well selected, broad in treatment, and shows that Mr. Nicholson has an eye for the beautiful.

"The second silver medal is awarded to Messrs. Robinson and Cherrill, for their 'Gleaner' (No. 728), showing all the characteristics of their work (for which they are so justly famous), but scarcely equal to former productions exhibited here by them—'Bringing Home the May,' for instance, of which we have a lively and pleasant recollection.

"The first bronze medal is awarded to Mr. W. Brooks, of London, for his fine enlargement of trees (No. 731), evidencing that Mr. Brooks has an intense love of his art, and that he is an artist capable of producing eminently beautiful work; the distances are atmospheric and well rendered.

"A first bronze medal is awarded to Mr. George F. Dew, of Leamington, for his collection of beautiful landscapes, which are all well selected and cleverly manipulated. 'Kenilworth' (No. 758) is very fine.

"A special first bronze medal is awarded to Messrs. E. P. Lee and Co., of Cardiff, for their case of coloured ceramic photographs, which are gems of art.

"A first bronze medal is awarded to Mr. J. M. Young, of Llandudno, for his well-lighted and beautifully modelled portrait studies.

"A first bronze medal (special) is awarded to Mr. B. Wyles, of Southport, for his instantaneous studies, entitled 'Cloudland,' which are exceedingly artistic productions.

"Others exhibiting, and whose works deserve special notice, are Mr. Lafosse, who sends some very fine portraits—see No. 702; Mr. Garrett Cocking, who is a thorough artist in feeling, and a very clever manipulator—see No. 737, 'Caller Herrin,' and No. 739, 'The Knight of the Bath, &c. We hope to see more of Mr. Cocking's works.

"Messrs. A. and J. Bool, of London, send some very fine landscapes. Their 'Hampshire Lane' (No. 679), and 'A Wayside Bridge' (No. 676), particularly the last-named, have a sheeny effect well rendered. Both are taken direct from nature. Mr. R. Mitchell, of Bolton, sends four excellent landscapes.

"The Amateur department is also well represented—first, by the splendid collection (of about thirty works, including landscapes and portraits) by Mr. Robert Crawshay, to whom is awarded a first silver medal for his large study of 'Daisy' (No. 829). No. 801, 'Portrait of the Right Honourable the Marquis of Bute,' is also very fine, as are several others. Secondly, by Mr. W. A. Grant, who sends some splendid bits from Russian Lapland—see frame No. 831—many of which were taken at midnight."

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PHOTOGRAPHY AND ASTRONOMY.

BY M. J. JANSSEN.*

The attention of scientific men is just now called to the supposed existence of bodies which circulate between the sun and Mercury. In the Academy of Sciences, some learned discussions have arisen on this subject, and M. le Verrier, one of my colleagues in that august assembly, has endeavoured to establish the existence, based upon astronomical observations of more or less value, of one or several heavenly bodies of which we have hitherto known nothing.

Whatever may be the issue of the controversy, whether M. Le Verrier may prove in the right or not, the subject, to my mind, is one of considerable interest, the more so from the circumstance that we have it in our power to secure a solution of the problem in a novel manner, and in a way, too, which will be complete and trustworthy.

The means which physical astronomy may place at the service of science are naturally divided into two distinct classes.

On the one hand, we have the knowledge recently acquired respecting the constitution of the solar envelope, knowledge which permits us to submit the observations under discussion to a new criterion; and, on the other hand, we possess, to-day, particular processes of photographic registration which permit us to obtain, automatically, observations which, by their number, their authenticity, and their precision, cannot be replaced in any other way.

It is apparent that the whole difficulty of the question is to be found in the uncertainty and inadequacy of the results secured. We have the observations of persons who are of opinion that they have witnessed the passage of a body in front of the sun; but these observations are rarely sufficiently precise, and even if we admitted that they did show that a veritable passage had taken place, the observations have not been undertaken with the necessary exactness to furnish results indispensable to us in order to calculate the elements of the bodies in question.

Touching the question of a veritable passage, the observation must generally be confined to showing a very round spot upon the solar disk, and to proving that this moves in quite a different manner along the solar surface than is apparent in the case of spots on the sun. These points must be established, for they permit one to eliminate at once a large number of doubtful observations.

But even with the establishment of these two points, an observation may nevertheless fail to prove that there is a veritable passage of a heavenly body between the sun and Mercury. For some time past—and photography has given us also some recent examples on the subject—it has been known that the sun often presents spots of extraordinary rotundity, and of almost perfect shape, more perfect even than the spots that would be given by the majority of our superior planets if they could pass the sun. The rotundity of a spot is therefore no distinctive mark. There remains, therefore, its movement over the face of the sun. But here, again, we meet with a circumstance which may give rise to illusions. When we observe the sun with a lens which is not mounted as an equatorial, but the foot of which has two vertical and azimuth movements, as is usually the case, the position of a spot, in consequence of the diurnal movement, changes incessantly by reason of a vertical diameter of the disk. Even with the most skilful observers it is difficult not to believe that the spot has displaced itself upon the disk. I had a very striking example of an illusion which may be produced under the circumstances during my observations of the Transit of Venus. A grand personage of the kingdom of Siam, an amateur in astronomy, showed me at the time of my passage through Bangkok a drawing which he had made of the Transit of Venus. Upon the sketch were indicated the successive positions taken up by the planet, but the little circles indicating the planet were disposed in the arc of a concave circle towards the centre of the disk, and the personage in question considered this circumstance to be the most important in his observation. Everybody surmised that it was an illusion produced by the diurnal movement during the transit. Of course if the movement proper was obtained by micrometric measures, attesting a rapid variation of distance from the body to the centre, or to the margin of the solar disk, there would be no reason for doubt; but these are precisely the precautions which usually fail.

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* *Moniteur de la Photographie.*

The fact of the disappearance of the spot when you come to make the next observation of the sun, either the next day or half a day afterwards, cannot be invoked as a peremptory proof that the object was really situated outside the sun. I have already been able to demonstrate by the aid of my series of photographs that when the sun is at the period of a minimum, the spots have a surprising tendency to dissolve. The year 1876 presented several remarkable instances of this.

It results from these considerations that isolated observations made by persons who have not profoundly studied the subject, or who do not possess fit and proper instruments, will scarcely furnish us with materials of a sufficiently accurate character to solve the question.

On the other hand, it is evident that we cannot ask astronomers, who are absorbed for the most part in other works in which they take a personal interest, to follow with sufficient assiduity the sun in different parts of the globe, so that we may be assured that no passage of a planet escapes us. It is obvious that we are compelled of necessity, as it were, to demand of photography what ocular observation cannot furnish us with. And this is the matter to which I wish more particularly to call your attention.

But, in the first place, I must revert for a moment to observations made with the telescope. In my humble opinion, these cannot afford us a solution to the problem; but nevertheless they are replete with interest. Science owes some of the most beautiful discoveries to men who at different times have cultivated astronomy without regarding it as their profession, and therefore it cannot afford to allow the services of such men to go unrecognized, or to cease from encouraging them.

We have seen that the rotundity of the spot is not a characteristic symptom, that illusions due to the ordinary movement are very easy to occur, and that even the disappearance of the object after five or six hours does not incontestably prove a veritable passage of a body. But there exist properties derived from the constitution of the photosphere which may permit us, even during the brief instants of a fugitive observation, to decide whether the phenomenon observed is solar or extra-solar. The surface of the silver is seamed with granulations to which different names have been given, but which are well known to every observer familiar with the luminary. The granulations are modified on the margin of the spots, and these, independent of the penumbra, which is seldom defective, especially in the case of round spots, are surrounded by a circular facula, which almost always throws an appendix or halo around it. In a word, the solar spot is a photographic phenomenon.

(*To be continued.*)

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PHOTOGRAPHY UNDERGROUND.

We have to record, says the *Birmingham Daily Post*, a novel and interesting application of this most useful art. A few days ago, we believe for the first time, an experiment was successfully made for the purpose of obtaining an accurate picture of some underground workings in a coal mine, the process being effected by means of the oxyhydrogen light, generally known as the lime light, in combination with magnesium riband in combustion. The scene of the experiment was the Bradford Colliery, Bentley, near Walsall, where, a few days ago, Mr. Frederick Brown, of Walsall, who is well known as a skilful manipulator of the camera, accompanied by Mr. Chiddey, representing the firm of Messrs. Duignan and Co., solicitors, of that town, attended at the mine for the purpose of obtaining representations of certain portions of the underground workings to illustrate a question of practical mining which is incidental to a litigation respecting that colliery, and, having made some preliminary experiments with magnesium light, came to the conclusion that photography would be perfectly possible under conditions which exclude sunlight altogether. The preliminary investigation was attended with some amusing incidents, in consequence of the surprise of the colliers at seeing so brilliant a light in the mine, where nothing but the light of a halfpenny candle had ever been seen before. Upon the following day, Mr. Brown, attended by one of the proprietors of the mine and the deputies, successfully obtained pictures of the portions of the mine indicated by Mr. Chidley. The photographs, as finished, are not only in themselves valuable for the purposes of evidence for which they were required, but, when viewed in the stereoscope, form perfectly accurate delineations of the places from which they were taken; and, indeed, without an explanation that they had been taken altogether by artificial light, the ordinary observer would suppose them to have been produced by the action of the sun in the ordinary way. The process occupied for each picture from twenty-five minutes to half-an-hour while the sensitive plate was under the action of the light. One of the principal technical obstacles which Mr. Brown had to encounter in the chemical portion of the process was that the ordinary wet plate, although so much more rapid in its action, would not retain its moisture for the lengthened time of exposure rendered necessary under the altered conditions of light and the well-known increased temperature in mines; but this difficulty was, after repeated experiment, admirably overcome by a chemical formula which Mr. Brown was fortunately able to devise to meet the special emergency. The difficulties of focussing arising from cramped position in the mine were, of course, merely mechanical, but consumed much time to overcome. The result appears important in many ways, as suggesting in future the possibility as well as the propriety of photographing the interior of mines after accidents, and in the course of litigations and the like, for the edification of those who have not had the opportunity of visiting the spots, and yet might have to decide questions respecting them. The possibility also of introducing a powerful and steady light completely under control, which may be fed from the surface by means of flexible tubing, and which would enable a light rivalling that of day to be sent into dangerous places from a convenient and safe distance, appears to us to open a pathway to very important practical application, and we shall be glad to see this new phase of photography more widely extended and experimented upon. In any aspect, the demonstration that perfect lens pictures ban be obtained altogether independent of the sun deserves attention.

The Photographic News.

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"SPIRITUALISM" AT A PHOTOGRAPHIC MEETING.

The recently resuscitated Photographic Society at Glasgow inaugurated its winter session by a somewhat remarkable meeting, which, whilst doubtless full of exciting interest, did not, probably, tend much towards edification. Complaint has been made more than once lately of the lack of subjects of novel interest at photographic societies, and the fact that some of the societies seem to lead a slow, languid existence has been attributed to the alleged fact that subjects of stock interest were "played out," and that novelties to discuss were not forthcoming. Our enterprising friends in the city of the Clyde have, beyond question, found a novelty, but in a direction which we can scarcely hope photographic societies generally will essay to follow.

Mr. Urie, whose name we remember from an early period in the history of photography, brought before the society a paper on "Spirit Painting and Drawing," and gave demonstrations of the mode in which what he described as "showmanlike trickery, alike unprofitable and contemptible," might be managed, and issue in what he believed to be a "downright swindle." To explain the origin of all this, we should state one or two of the antecedent facts. Spiritualism and its alleged impostures have occupied considerable attention of late in many places. Glasgow appears to have been unusually favoured in its manifestations. Mr. D. Duguid is known as a trance medium who produces paintings under very remarkable conditions. In the *seances* with which he favours his friends, he is alleged to pass into a state of coma or trance, and in this state, with eyes fast closed, he proceeds to paint with great rapidity on the canvas placed on his easel. The gas being turned out, he still proceeds, without hesitation, with his painting. At other times, whilst the medium is in trance, and the gas turned down, cards placed before him on the table, together with pencil and colours, are found, a few minutes afterwards, when the light is turned up, to contain minute clever paintings. The same results are said to take place when the medium is bound fast in his chair, and his hands securely tied. Mr. Duguid and his friends, we understand, attribute these results to spiritual agency, whilst Mr. Urie, at the photographic meeting in question, attributes them to trickery and conjuring, and he demonstrated the possibility of doing something similar by means which, until explained, would certainly puzzle the ignorant. The details of the various methods employed to produce these effects will be found in the report on another page.

It scarcely comes within our province to enter into any examination or estimate of the phenomena of what is termed spiritualism, with which, however, curiously enough, many photographers seem to be associated. It seems to be quite certain that much which comes under the public eye with spiritualistic credentials is the rankest humbug, the most thinly clothed and impudent imposture. The majority of the "spirit photographs" which have come under our attention have carried the trickery written upon their faces. But, on the other hand, if testimony of capable investigators—men whose lives have been passed in the most delicate and recondite researches in connection with physical science, men like Professor Barrett, Alfred R. Wallace, Wm. Crookes, Lord Lindsay, and a host of other distinguished men of science—if the testimony of such men be worth anything, they have met with actual phenomena not explained by the ordinary laws of nature with which at present we are familiar. Regarding the trance painting, it is possible that neither the assumption of trickery, nor the acceptance of the spiritual theory, may be necessary to explain it. We may, without being subject to Sadducean imputations, assume the possibility of a *tertium quid*. The state of trance, as a purely physical state, has for ages presented some difficult studies to biologists. Many cases are recorded of painting, writing, musical performances, and other occupations being carried on with great skill whilst the subject has been in a state of trance. Cases of students preparing for examination, anxious almost beyond endurance for success, and excited by the feeling of being backward in their preparations, have risen in their sleep and rapidly and accurately completed or accelerated their preparations. Painters deeply interested in a painting have risen and, in a sleep walking trance, added good work to their pictures. We have seen a person writing in a state of sleep. Somnambulists have often been known to go to a piano and play fine harmonies quite accurately. All these cases illustrate unsolved psychological problems, alike removed from the region of the supernatural on the one hand, and the practice of swindling on the other. We cannot but regret, however, that a photographic meeting should be regarded as the fitting arena for a discussion quite outside its legitimate aims and purposes, especially as it brings into antagonism the beliefs, on questions foreign to photography, of estimable members of the Society, and tends to disunion, instead of fostering the fraternal feeling which is necessary to success.

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MEDALS AT THE PHILADELPHIA EXHIBITION.

Some rather curious statistics relating to the medal awarded in the photographic department of the Centennia Exhibition are given in our Philadelphia contemporary By whom the awards were made, or of whom the jury con sisted, we have never heard, never seen stated. That i was an International jury may be assumed from the fac that Dr. Vogel went from Berlin to represent Prussia. So far as we know, England was not represented; or at least we have not heard of any English jurymen, nor have seen the names of the representatives of any other country. As a rule, there can be no doubt that the decisions of such juries of award aim at justice, and such decisions, we believe, in the main secure justice; but at times omissions in the awards strike outsiders as at least curious. The list of photographic awards at Philadelphia is disappointing, both in its omissions, and in the relative honours distributed amongst various countries. In some countries every exhibitor obtains a medal, whilst in another case only one exhibitor in five is so honoured. The photographers of the United States have come off worst in this respect: of one hundred and thirty-five exhibitors, twenty-seven received medals, whilst six exhibitors from Russia received six medals. Great Britain is next in order as to number of exhibitors, twenty-six photographers having sent contributions, and of these eleven have received medals. Germany fares better, receiving seventeen medals for twenty-four exhibitors. Austria, with eleven contributors, receives five medals; whilst France receives six medals for ten exhibitors.

There is, of course, a very simple explanation which partially makes matters clear. In America, where the difficulties of sending were less formidable, and a patriotic spirit probably existed, a larger number naturally contribute, many of them less because of the great worthiness of their work, than from a feeling of duty to send something to the Centennial; whilst in distant Russia, any photographer sending his pictures would do it from a knowledge of the great excellence of his contributions, and these conditions naturally secure a greater proportion of medals to the latter country. But notwithstanding this partial explanation, we can well understand and sympathize with a feeling of disappointment amongst American photographers, when we see absent from the list of medallists many photographers of the highest rank, whose work sent for exhibition could not fail to be of very high quality: such men as Gutekunst, of Philadelphia, and Landy, of Cincinnati, mentioned by our Philadelphia contemporary, and we can remember a dozen more who contributed, but fail to receive prizes. The awards to British photographers surprise us when we compare the recipients with those passed over, especially as we find amongst the latter such names as England, Slingsby, Crawshay, G. W. Wilson, and other high-class men. The race is not always to the swift, nor the battle to the strong, and those who have failed must take consolation in the reflection that it is better to merit than to win.

A PRIZE OF TWO THOUSAND FRANCS OFFERED FOR IMPROVEMENT IN THE APPLICATION OF PHOTOGRAPHY.*

Among the prizes offered by the *Societe d'Encouragement* there is one which concerns photography, and which we extract for the benefit of our readers.

A prize of two thousand francs will be awarded to the invention of a process permitting the transformation of a photographic cliche taken from nature, and possessing finely graduated tones, into a printing block which may be put into a printing press and machined without difficulty, with ordinary type, and which gives results equal to the blocks ordinarily used.

The *Societe d'Encouragement* is convinced of the aid which such an invention would give in many directions. The facile application of everyday photographs in this way would be of great assistance in connection with publications of a scientific and artistic nature especially. One of the great merits of photography is the fidelity and authenticity of its results, and the fineness and detail of its pictures, no matter how complicated they may be.

There is no need to fear that in pictures produced by the camera, like those furnished by the engraver, personal and individual errors become interpolated, and this is a point of which we should be assured in the employment of the photographic cliché in the printing press, while at the same time the process could give us more expedition, and allow of printing blocks being prepared with greater rapidity.

Photography will find in this application further scope, and the Society has no doubt that this union of photography with typography will have the effect of rendering these two industries more important than ever.

We are further informed that if the prize is awarded at all, it will be adjudged in the year 1880.

PHOTOGRAPHIC LOTTERIES.

A somewhat novel and ingenious mode of getting rid of old stock in photographs has recently been tried and brought to an untimely end, the details of which will be gleaned from the following paragraph in a recent police report in the *Times*:—

> At Marlborough Street, Samuel Wood was summoned before Mr. Knox, by the police, for unlawfully suffering to be exercised and drawn by cards, numbers, and figures, a certain lottery, at his house, 11, Oxford Street, and Jeruso Sutton was summoned for aiding and abetting. Superintendent Thomson watched the case for the police; Mr. J. Kisch defended. Police-Sergeant Kerley, E Division, stated that he visited the shop at 11, Oxford Street, in which photographs were exposed for sale. The business was carried on by Wood, and the other defendant was his assistant. Witness had previously seen in the window a bill stating that £1,000 would be given away in prizes. The way this was to be done was by writing a sum of money on the backs of photographs, which were to be mixed with other blank photographs. The customer, after paying one shilling, was to pick out a photograph. If it was blank he received nothing; if a prize, he received not only the photograph, but the amount written upon it. In answer to Mr. Kisch, the sergeant said out of three photographs which he bought, two were prizes, for which he received money payments. Mr. Kisch produced a large number of the photographs, about half of which had a sum of money endorsed on the back, some as much as five shillings. In answer to the summons, he said the defendants, who were Americans, had no doubt infringed an old Act of Parliament without being aware of its existence. They would, however, discontinue to do what was contrary to law, and under these circumstances he asked that the summonses might be adjourned for a month, without a penalty. Mr. Knox, after remarking that the defendants had rendered themselves liable to three months' imprisonment, acceded to the suggestion of Mr. Kisch.

It is, no doubt, in the interest of public morality that everything resembling a lottery—in fact, everything like gambling, always excepting, of course, the Turf and the Stock Exchange—should be promptly put down by law. But it may seem rather hard that the owners of a large stock of old photographs should be debarred from applying a stimulus to their sale by intermingling them with prizes. Photographers must remember, however, that the course above described is illegal. If they place their old stock in what is called a "lucky bag" at most bazaars, which is a bag generally filled with articles worth a penny, into which, upon payment of a shilling, the adventurer may plunge his hand, and retain for a shilling any single article he may draw forth, he may possibly get rid of some of the photographs upon similar principles to the prize plan above described. The resemblance to a lottery will be quite as close, but for some reason it appears to be tolerated by the law.

SOUTH LONDON TECHNICAL EXHIBITION.

The technical meeting of the South London Society this year did not rival the similar meetings of previous years, either in the multitude of novelties and objects of interest exhibited, or in the tendency to discussion which has on some occasions prevailed. The meeting was pleasant and interesting, but there was no *embarras de richesse.* In fact, very little response had been made to the invitations sent out to photographers generally to contribute novelties, in apparatus or mode of working, for the evening's instruction and entertainment. As we have had occasion to remark in referring to the Photographic Exhibition, the year seems to have been a barren one so far as photographic ingenuity or research is concerned. The attendance was not so large as usual, either, comparatively few but the ordinary members of the Society being present.

The usual routine proceedings being completed, a number of members were elected, as follows: Messrs. H. Mansfield, C. G. Cutehy, Miller, Burrows, Colton, G. A. Baker, and L. Gumprecht.

Mr. Werge exhibited some improvements and additions in the shape of a reflector and other appliances he had made to the simple and efficient copying camera he had exhibited at the last technical meeting. Mr. Werge also exhibited some examples of a very simple and efficient method of enamelling cards and other photographs. The material employed had been patented under the name of

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* *Moniteur de la Photographie.*

"Decorative Enamel;" it was applied in a manner similar to French polish.

A dissolving view apparatus, called Malden's Trinopticon, was exhibited; and after the exhibition of an improvement in a portable camera by Mr. Henery, Herr Warnerke exhibited and explained a couple of actinometers of French invention—one by Mons. Hermagis, and the other by Mons. Vidal.

Mr. Foxlee gave some details of the preparation of durable sensitive paper for use in the ordinary actinometer. It consists of ordinary albumenized paper, sensitized on a bath containg twenty grains each of nitrate of silver and citric acid to an ounce of water. The paper kept good for several months. A conversation followed, in which Mr. Brooks remarked that Carrier's paper kept good for years.

Some fine combination negatives by Mr. Adam Distin were exhibited, and a conversation on their mode of production followed. They were produced by the method described by Mr. Johnston, of Wick, some years ago. A brief paper by Mr. Fenessy, suggesting that toughened glass might be found useful in photography, was then read.

Mr. W. Brooks showed some interesting prints from small paper negatives. Carbon transparencies were obtained from the original negatives, and from these negatives prints were obtained on albumenized paper in the usual manner. These being waxed gave exceedingly delicate and fine results. A conversation on waxing paper negatives followed, in the course of which Mr. Brooks said a common fault was to remove too much wax by ironing. Mr. Brooks also showed some emulsion negatives by means of very short exposure. (For further details of Mr. Brooks' exhibits see next page).

Mr. Foxlee exhibited some very fine carbon prints from reproduced negatives by the method M. Lambert styled "Contretype." A conversation on intensifying carbon negatives followed, in which Mr. Foxlee said that the special tissue made for the purpose contained a very thick layer of gelatine, and this readily intensified under the action of permanganate of potash.

Mr. J. T. Taylor exhibited and explained the action of Messrs. Burrows and Colton's useful and ingenious desk for retouching negatives.

Mr. Skinner exhibited some fine examples of the platinum printing process, which elicited some desultory conversation. A print illustrating the injurious action of bronze gold printing on card photographs was exhibited, and some conversation followed.

Desultory conversation occupied much of the time of the evening, and the meeting finally devoted itself to individual examination of the various articles shown.

The proceedings then terminated.

ANNUAL DINNER OF THE SOUTH LONDON SOCIETY.

The South London Photographic Society, in maintenance of a custom now established for many years, dined together, on the evening of Saturday last, at Anderton's Hotel, between thirty and forty of the members and friends being assembled. The President, the Rev. F. F. Statham, M.A., headed the table, and two of the Vice-presidents, Messrs. Spiller and York, occupied the vice-chairs. After a capital dinner, and the customary loyal toasts,

The Chairman proposed the principal toasts of the evening, which included "The South London Photographic Society," and "Success to Photography," and in the course of his remarks dwelt on various points of interest in relation to both matters. Respecting the Society, he expressed some regret that a larger number of photographers did not avail themselves of its advantages. Without aspiring to the dignity of the Photographic Society, it did a large amount of useful work, and more especially offered advantages to the young and inexperienced students of the art. They could come to it for advice, could submit to it the results of experiments, would always find that their earliest efforts would receive encouragement, and any assistance or information which it was in the power of the members to offer would be readily forthcoming. The rev. gentleman also dwelt on the social features of the Society, which were most gratifying. Touching photography generally, he remarked that the last few years had not been distinguished by any special novelties or marked progress; but then it must be remembered what strides the art had made during its short existence—only a quarter of a century or so. It might be said with truth that photography was yet in its infancy. No man could tell what developments lay before them, or what services it would yet render to mankind. Used in conjunction with other discoveries, who should say but the time would come when it might be possible to say to a man in New York or in China, "You be in a certain room at a given time, and your portrait will be then taken there and here in London?" This would not be more surprising than what really had happened. Who, twenty-five years ago, would be believed that we should at this moment be waiting for the photographic results of the Transit of Venus in order to tell with absolute accuracy the distance of the sun from the earth?—a point of momentous importance. There had been, it had been said, a slackness of late in the photographic portrait trade. Well, he hoped that would stimulate ingenuity and experiment, and result in novelty. People always wanted something new. They should take a hint from the milliners, who every month issued a new fashion plate. It did not follow that the new was better than the old; on the contrary, they were sometimes worse; but they were new, and everybody must have them. So with portraits. Let a novelty come out, and if Mrs. Smith got it, Mrs. Brown must have it; and, of course, her daughters, and in time the whole of the family. These were commercial hints, but he thought it their business, as members of the Society, to glance at art or science in all its bearings, high or low, for their mutual advantage and that of the public at large.

Mr. Cocking, whose name was associated with the toast, in his response gave some interesting statistical details regarding the Society.

"Photography," "The Visitors," "The New Members," "The Chairman," and the "Vice-presidents," were proposed, and duly responded to by Messrs. Spiller, York, Burrows, Grieves, and others. "The Press," proposed by the chairman, was responded to by Mr. G. Wharton Simpson, by Mr. Taylor, and by Mr. William Sawyer on behalf of the *South London Press*.

Songs, glees, and recitations by the members and guests contributed much to the interest of the evening.

NOTE ON THE DECOMPOSITION OF A SOLUTION OF IODIDE OF POTASSIUM BY LIGHT.

BY M. BATTANDIER.

It has often been observed that a solution of iodide of potassium turns yellow under the influence of sunlight, and after a time contains free iodine. According to Vidau* this decomposition is due to light alone, and the atmosphere takes no part in the phenomenon. In seeking to verify this statement the author has arrived at a different conclusion.

A ten per cent. solution of pure iodide of potassium was divided into three portions, and exposed (1) to sunlight in the open air; (2) to sunlight in a vacuum; and (3) to the air in the shade. Decomposition took place in No. 1 only. The liquid first turned yellow; then at the end of the third day it gave up to chloroform a small quantity of iodine which gradually augmented. The experiments were repeated three times, being continued during a fortnight each time, and always with the same result.

These experiments appeared to demonstrate that the intervention of air is necessary to the decomposition. To verify this the same solution was exposed (1) to air and sunlight; (2) to air and sunlight after boiling; (3) to air and sunlight after passing through it a current of pure carbonic acid; (4) to air and light, with a little chloride of barium; (5) to air and light with a little caustic potash; (6) to sunlight and in confined air deprived of carbonic acid by lime; (7) to sunlight and in carbonic acid deprived of air.

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* *Pharm. Journ.* [3], vol. v., p. 383.

In experiments, 4, 5, and 6, no appreciable decomposition took place. In experiment 7, on the contrary, it was quite energetic, so that in two hours the solution was already sensibly yellow, and it gradually darkened. In experiment 3, the decomposition was a little less energetic; and still less pronounced in experiments 1 and 2.

From these experiments the author concludes that sunlight and acids present in the atmosphere, and especially carbonic acid, are the principal agents of the decomposition, which results, probably, from the setting free of a little hydriodic acid.

Vidau found the decomposition to take place in the presence of an excess of caustic potash; this the author would attribute to the action of ozone. He has noticed that his altered solutions possessed marked decolourizing properties, a peculiarity that he has also met with in the iodide decomposed by ozone, and in a liquid obtained by saturating a solution of potash with iodine.—*Pharmaceutical Journal.*

PAPER NEGATIVES.

BY WILLIAM BROOKS.*

I think a few words will not be out of place at this meeting on the subject of reproducing negatives the same size as the originals when a large number of prints are required, which I have successfully adopted in my own practice, giving results equal to collodion negatives on glass. A negative and print by this method I will now pass round for your inspection, and I think you will all agree with me that the results compare favourably with prints from the original negative. I proceed thus:—

A transparency is made in the ordinary way with carbon tissue developed on glass (made from tissue prepared by the Autotype Company expressly for transparencies). The transparency must be perfect, namely, *bare glass* for pure whites and intense blacks for the shadows, and the corresponding gradations between these two extremes. When perfectly dry a paper negative is printed from this in the printing-frame, in the ordinary way, on either *thin* Saxe or Rive albumenized paper, salted with not less than ten or twelve grains of chloride per ounce, and sensitized on a sixty or eighty-grain nitrate bath. (The paper used must be thin—medium Saxe or Rive will not do). Print as deeply as possible, so that by reflected light the shadows in the negative are a little tinted; a few printed of different depths from the same transparency will impart experience better than I can describe in this short paper. I prefer to pass them through the toning bath slightly, but they must be kept of a brown colour. Fix, as usual, in hypo.

When dry, the resulting paper negative requires to be waxed (to render it as transparent as possible) with either pure white wax, or, as I myself prefer, a mixture of Japan wax and solid paraffine, which is far cheaper. Lay the albumenized surface down on a warm glass plate, and scrape over it shreds from a lump of the waxing composition, and then with a hot plastering-iron (the same as is used by the chemists for spreading plasters) spread the wax evenly, so as to saturate the paper perfectly. I like to leave plenty of wax on the paper (as it keeps the grain of the paper from showing), and not to iron it out between blotting-paper, as some recommend.

When cold and hard, print from it in the ordinary way in the printing-frame (using a clean glass plate as a support) in a good light—the brighter the better, but avoiding sunlight, which would melt the wax. Prints printed in a weak light have a tendency to show the grain of the paper of the negative.

I may add that the transparency may be made in the camera, on collodion, but for negatives of the same size I prefer carbon tissue.

EMULSION NEGATIVES.

BY WILLIAM BROOKS.*

I have during my photographic career attended a great number of meetings, and have seen but very few emulsion negatives exhibited. I think that now, as we have here so many gentlemen from the country, it may gratify some of them in looking at the negative I now pass round.

In connection with emulsion negatives, I have heard a great many say that it is very difficult to get detail in the shadows with collodio-bromide emulsion. I think the negative now being passed round will quite disprove these assertions. The subject photographed is a most trying one, taken in broad summer sunlight, being an Armstrong gun on its carriage, with wooden sheds and heavy shadows. These shadows are full of detail.

I am sure you will all agree with me that it would be a most trying subject for a wet plate, as regards solarisation, when the light falls on the top of the gun. In this negative, instead of being solarised, it is soft and yet brilliant, and the heavy shadows under the gun are extremely full of detail.

I feel convinced that if my brother photographers would only take up this beautiful process and work it with a will, in time we should soon get rid of the nitrate bath, and also the smell of collodion in the studio, to which so many object.

The negative I now pass round is enlarged from a quarter-plate taken by the bromide emulsion process (collodion). The transparency requiring to be larger than the original must, of course, be made on collodion in the camera. When the negative is an enlarged one, I prefer to use a plain paper (not albumenized), which is now to be obtained in the market, answering every requirement for this process, as greater depth can be more easily obtained. The after processes—such as fixing, waxing, &c.—are the same as described above.

Correspondence.

HONORARY SECRETARYSHIP OF THE PHOTOGRAPHIC SOCIETY.

Dear Sir,—Circumstances over which I have no control have compelled me to place my resignation of the post of Honorary Secretary of the Photographic Society of Great Britain in the hands of the President and Council.—I am, faithfully yours, R. J. Friswell.

30, *Richmond Crescent, Barnsbury, November 14th.*

A PHOTOGRAPHIC SOCIETY FOR BIRMINGHAM.

Sir,—As I am a photographer, living in the neighbourhood of Birmingham, and wishing to improve my knowledge of photography, I thought I would join a photographic society. For that purpose I have made enquiries in Birmingham, and cannot hear of there being a photographic society in that town. Of course, after making these enquiries, I must presume that there is no such thing as a society where photographers may meet together and improve their professional standard by the reading of papers, discussions, &c. Now, sir, it does seem something strange that a large town like Birmingham should be behind other large towns, such as Edinburgh, Manchester, Liverpool, and Oldham, where there are societies. Now, I cannot see why

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* Read before the Technical Meeting of the South London Photographic Society.

Birmingham should not possess a flourishing society. I am sure there is no place in this country where there are such opportunities for acquiring a knowledge of the other sciences as in Birmingham; and if the idea of forming a society could only find one or two influential members of our profession to take it up, I am quite convinced we might yet have as good a society as any other town. There is no occasion for Birmingham to stand still in this matter for lack of ability, for we have men amongst us, both professional and amateur, in plenty. second to none in ability, in the town of Birmingham, putting out of the question a large number of members we should get from neighbouring towns, such as Walsall, Dudley, West Bromwich, and various other places, in the centre of which, and of easy access, stands Birmingham. The benefits we should derive from such a society are numerous. In the first place, it would bring together all who wished for the advancement of our beautiful art science, and that would create a friendly feeling where, perhaps, there had only existed a feeling of rivalry. Then, another benefit we should derive would be from the discussion of communications brought forward by the members, which could not help but advance our science. Then we might have various excursions in the summer time, for there are plenty of beautiful country places within a few miles radius of Birmingham that abound in objects which would make fit subjects for the camera. Then I have no doubt we might in time be able to hold annual exhibitions, for there are plenty of places suitable for such an object. The Society of Artists hold several exhibitions during the year, and why should not the photographers of this large town and neighbourhood have one exhibition of their work each year? I think that if some of our professional brothers would only take this matter up, there would soon be found plenty who would be glad to support it; and there is no doubt there would have been a society here before this if it had only been thought of and mentioned. My hope is that some one will take it up, and as soon as possible. Hoping you will kindly give this a prominent place in your influential paper, and thanking you for the same, I am, sir, yours &c., S. V.

Proceedings of Societies.

Photographic Society of Great Britain.

The first meeting of the session was held on the evening of Tuesday, the 4th, Mr. J. Glaisher, F.R.S., in the chair. The minutes of a preceding meeting having been read, the following gentlemen were elected members of the Society: Messrs. G. Nesbitt, Oeffelein, Andrews, Hazhard, and Shuter. Some interesting photographs were exhibited by Mr. F. N. Broderick, jun., showing the track of the Tornado in the Isle of Wight, a short time ago.

Mr. Harrison, of Paris, exhibited some very fine examples of photography by Mons. Valletto, of Mexico; the negatives were described as untouched. The prints, which were in carbon, printed by Mr. Harrison's son, were exceedingly fine. Mr. Harrison also showed some fine matt carbon prints, consisting of reproductions from the work of Millet, a French peasant painter. All the photographs were much admired, and Mr. Harrison was thanked for introducing them to the Society.

A paper read by the Rev. W. A. C. Atkins on a Photographic Tour in Italy, and another by Mr. J. H. Worsley Benison on his Botanical Stereographs, were then read, but did not elicit discussion.

The proceedings then terminated early, to allow members a final opportunity of examining the photographs on the walls.

Glasgow Photographic Society.

How "Spirit" Paintings may be Produced.

The first meeting of the winter session in connection with the Glasgow Photographic Society was held in the Religious Institution Rooms, Mr. Mason presiding, on the evening of the 9th inst. After the transaction of some purely Society business, the meeting proceeded to hear a paper promised by Mr. Uric, on "Spirit Painting and Drawing." By way of explaining the bearing of the lecture, we may quote as follows from a printed paper which has been handed to us describing the way in which Mr. D. Dngnid, well known as a local trance painter, gets into his work:—

"The medium places himself in a chair, and sits quietly for a few minutes, when his eyes close, and he appears like a person in the mesmeric trance. Presently he rises from the chair, advances a step (his eyes still firmly closed), smiles, shakes hands with his invisible friends, and bows politely, with an air of reality about the affair that is somewhat amusing to onlookers. The introduction over, he walks up to the easel, and begins work on the canvas before him. We are surprised at the rapidity with which he works. He stops for a few seconds occasionally, and looks at the picture knowingly, sometimes rising from the chair and retiring a step or two. To show that the light is of little consequence, except to enable visitors to see, the gas is frequently screwed out; but there is no cessation on the part of the medium. On one occasion we carefully noted the appearance of the work before lowering the gas, and, on turning it up suddenly in three minutes, found he had introduced several small boats on the loch in the foreground, and had brought out more distinctly a castle which stood on the margin of the water. What are called *direct* paintings and writings are got under the following conditions:—The medium, after painting in trance for an hour or so, takes a small blank card, tears off one of its corners, and gives the bit to some one of the visitors in the room. He then lays down the card on the table, or on the lid of his colour box, beside which he places two or three of his smallest brushes and pencils. The gas is then turned off, and there is total darkness for a minute or two; on lighting up, the card is seen to have on it a painting, drawing, or writing, and that it is the same card which was blank a few seconds before is clearly tested by the exact fit of the corner piece into the place from whence it was torn."

Mr. Urie, proceeding to read his paper, said he had been induced to consider this subject by the appearance of an article in the *Herald* describing a *seance* in Glasgow at which painting was alleged to have been executed by spirit agency. In that article, he said, the writer treated the whole as mere buffoonery, and as a shameless attempt to pass off as a spiritualistic production that which was only a grotesque caricature of nature and art. For himself, he did not fear greatly this invasion of their beautiful art by invisible competitors; on the contrary, he was inclined much more to dread living rivalry: but he greatly deplored the sneering which the common sense of mankind must needs suggest at this ludicrous aspect of the art question. The usual way, he believed, of producing these spirit wonders was by first putting out the light, joining hands, and discoursing sweet music; but as the spirit he intended to invoke rebelled against being put in the shade, he would call on the spirit of Gainsborough, in the full glare of gas-light, to paint another copy of the lost "Duchess of Devonshire." Mr. Urie then produced a number of small blank photograph cards, cautioning the audience against touching or too minutely examining them, as that, he said, might destroy the spirit influence. He asked the members to see that the cards were blank, and then suddenly he threw one on the table bearing a miniature likeness in colour, not a highly artistic one certainly, of the Duchess of Devonshire. This, he added, was not a photograph. It was a painting produced by spirits of turpentine. He next asked the members to tear off one of the corners of four of the small cards, and to preserve the morsels so severed by way of identifying the mutilated cards afterwards. Then he fixed the cards in upright fashion round a curious looking little stand, inside of which was concealed a phial containing sulphate of ammonia, and the whole being placed under a glass shade and exposed to the chemical action, the cards speedily showed writing of a sceptical kind, such as "Good spirits—Scotch whisky," "It's all humbug," &c. Following this, Mr. Urie picked up one of his blank cards, and, rubbing its surface, a tiny stretch of landscape came into view. This picture, he explained, was first painted on the card in the ordinary way, and was rendered invisible by a mixture of collodion and oxide of zinc being poured over it, the fluid becoming dry and colourless when held to the fire. The card was then apparently blank. To reproduce the picture, all that was necessary was to apply to it sulphuric ether and alcohol, or nitric acid, or any acid that would dissolve the oxide. Then, again, Mr. Urie gave to Mr. Robertson, the secretary, a quill pen, and asked him to use saliva for ink, and to write anything he pleased on a blank slip of paper; one of the members warning the secretary not to make it an I O U, as that might be used in evidence against him. Mr. Robertson wrote on the paper some invisible tracing, and handed it to the lecturer, who carried it behind his back, apparently manipulating it with both hands, and then showed it bearing his own name. This, however, was not a very successful trick, the paper being blackened and the name barely legible. Mr. Urie said that all that was necessary to do this trick was to write with saliva on a piece of paper, and then rub it over with black lead, slate pencil, or any similar pigment, which would reveal the writing. But the chemical methods for doing all that he had done were so numerous that he need not trouble the Society by referring to them. He explained with greater chemical minuteness the particular methods by which the tricks shown were carried out, and added that in order to produce a painting wet, they might "paint a piece of tracing paper, or any smooth elastic substance, with oil colours mixed with Canadian balsam, which will keep the picture moist for a long time. Attach to this a piece of elastic cord, and fix up the coat sleeve; then attach a 'bught' of gut to the lower end of the picture, so that the picture may draw it down under the hand, and thereby you may press it on any other card which may have been selected, and leave the impression. The elastic takes the original back to its former place whenever the hand is slackened. Or you may use a card with the painting on it, and transfer to any card in the pack." Mr. Urie went on to explain how spirit writing or drawing may be produced, as, for example, by the old method of printing from any negative by the ordinary process, and placing the print, before toning and fixing, in a solution of bichloride of mercury, when the impression would disappear, leaving the paper quite blank. The impression would be renewed by holding it over the fumes of ammonia, or placing the card between sheets saturated with hyposulphate of soda. As for spirit photographing, he thought it was a thing of the past, and that they all knew how it was done. Passing on to speak to the general question of spiritualism, Mr. Urie contended that if there were anything in it, we might surely expect the spirits of the departed great ones of the earth to do what would be a positive service to poor mortals, instead of indulging in showmanlike trickery alike unprofitable and contemptible. The whole thing he believed to be a downright swindle.

Mr. Bowman, who was afterwards called on to address the meeting, said the experiments which Mr. Urie had made did not constitute spirit-painting. What he had been dabbling in for the last four years was quite a different affair, and what Mr. Urie had said and done did not apply to it in the least. Mr. Urie's paper was just following in the wake of the daily newspapers, all of them showing how little they knew about the facts of the case. Spirit-painting had been actually demonstrated as a fact, and did not now need to be proved. He had no doubt that Mr. Duguid would give a *seance*, at which the Society would have an opportunity of seeing these strange things done—seeing them, at least, as nearly could as be, for he could scarcely say himself that he had ever actually seen them done. He had held a box, inside of which were a piece of blank paper and a pencil, but no chemicals for development, and yet drawings had been traced. They were assured that these things were done by spirit power, by spirits having hands sufficiently materialised to use artist's colours and produce a drawing. Of that he might almost say he knew it to be true; but it was necessary that they should not have prejudged the case in their own minds.

Mr. Urie said he might throw out a hint that there should be a meeting with the spirits on this matter—that they should give a *seance* openly, to show to the Society if such things were true. He had fully and openly demonstrated before them; why should not the spirits do the same?

Mr. Todd asked whether Mr. Urie had attended any *seances*, and, if so, whether he had detected the use of chemicals.

Mr. Urie said he had never attended any *seance*.

Mr. Todd remarked that in that case he had been stating merely suppositious things which he knew nothing about.

Mr. Parker observed that, according to Mr. Bowman, every one present must be willing to be gulled. That seemed to be an essential condition of spiritualistic *seances*.

Mr. M'Tear described one of Mr. Duguid's *seances* which he had attended. The gas was put out, and a canvas, marked on the back by different parties in the room, was placed before Mr. Duguid. He commenced operations in the dark, and after going on for a certain time they lighted the gas to a small peep. Mr. Duguid was still painting. Mr. M'Tear was asked to go forward and look minutely. He went over to Mr. Duguid and saw that his eyes were perfectly closed, so that it was utterly impossible he could see. There he was, painting with one colour after another, and gradually producing a picture. As to Mr. Urie's paper, he had shown some very clever tricks; but there was one thing done by Mr. Duguid which he was perfectly convinced all Mr. Urie's manipulation would fail to accomplish. Mr. M'Tear went on to describe how a small card, from which a corner had previously been torn, was placed on the centre of a table, while Mr. Duguid was tied on a chair with ropes. It was quite impossible he could move, and the chair itself was tied to something else, situated a long way from the table. When the gas was turned up a painting the size of a shilling was seen on the card lying on the table, and it was perfectly wet with oil paint, so that there could be no manipulation, which would simply have destroyed the whole painting. He did not think this system should be altogether run down, although he thought there was a great deal of nonsense talked in connection with spiritualism which they would be better without.

The Chairman expressed a hope that Mr. Bowman would give a *seance* to the Society.

Mr. Stuart pointed out that Mr. Urie had merely shown how certain things might be done, not how Mr. Duguid executed his paintings. He did not believe in spiritualism, but he thought this subject did not properly belong to them as photographers.

The Chairman said it was not photography, and the members would go to Mr. Bowman's, not as the Society, but as individuals anxious to investigate the question.

Mr. Parker asked why they should go to Mr. Bowman's, where all the appliances were at hand. They should challenge them to come to their place of meeting.

Mr. Robertson thought they were greatly indebted to Mr. Urie for having brought the subject forward.

Mr. Parker suggested that a *seance* should be held, if it could take place in the Society's rooms, and not in Mr. Bowman's premises.

Mr. Bowman replied that if this was to be a *seance* to test the thing and expose the trickery, they might save themselves the trouble, for Mr. Duguid would not sit on that principle at all, and he would not advise him to do so.

Mr. Parker—Because we are not ready to believe whatever we are told.

Mr. Bowman—We don't care three straws whether you believe it or not. It is a fact to those who know it, and I do not care, for my part, who does not believe it. They are at perfect liberty to leave it alone.

Mr. Duguid—I am the person referred to, and I may say that coming here to a photographic society, and not to a spiritualistic society, I have no right to give what powers I have to the society as a society. I claim that I have a gift, and a gift from above, and I am not afraid to stand and look any man in the face, because I know that the thing does happen, and not through me. Mr. Urie has poured forth sympathetic ink and all the rest of it, to try and show how it is done. I am not afraid to show the cards to any man, and I never yet prepared a card in that way. Cards have come to me with the marks of the pencil upon them, and I cannot tell how these marks come there. I know what transfers are as well as Mr. Urie, and on a transfer card you never see the pencil marks. I have never once seen a card that there was anything like dry paint on; the paint is as thick as treacle, and I cannot tell you what is the cause of it. I shall be willing to give any gentleman a *seance*, but I will not come here to do it. I am not a paid medium. I never took a penny from any one that I am aware of. I give what gift I have gratis.

Mr. Urie.—You sell your pictures, don't you?

Mr. Duguid—I never do.

Mr. Bowman—No, he doesn't.

Mr. Urie—Mr. Bowman does it.

Mr. Bowman—I do that.

Mr. Urie—Then that is being paid.

Mr. Bowman—No; it is not being paid, by any means.

Mr. Duguid—Let Mr. Urie take care not to say of me that I am a swindler, because he has said so to-night.

Mr. Urie—I did not say you were a swindler. I say the whole affair is a swindle.

Mr. M'Tear explained that in experiments in mesmerism there must be a spirit of sympathy amongst those present. He believed there was something in spiritualism; but he did not know that that was the proper name for it. If they were all to sit round a table, and any sort of feeling against the thing were to exist, he did not know that it would succeed. He hoped Mr. Bowman and Mr. Duguid would be kind enough to give a *seance* in their own place, and let the members examine everything.

Mr. Stuart—I have known Mr. Bowman for twenty years, and I entirely acquit him of any connivance in anything like trickery. I speak for Mr. Bowman. As for making money out of it, the thing was too ridiculous.

The Chairman said that as the matter stood, those who wished might see Mr. Bowman privately. He was sure Mr. Duguid would give a *seance* in his own place.

Mr. DUGUID—Yes, and whoever comes will have every liberty to search my house and see whether they can find any such chemicals as Mr. Urie has used.

A vote of thanks was then given to Mr. Uric for his paper, and the meeting separated.

In the course of the evening, it may be added, Mr. Bowman produced a couple of "spirit" cards similar in size to those which Mr. Urie had used. On one of these cards was a daubing of various oils, about the size of a halfpenny, which could not be said to resemble a picture of any kind, while the other bore a rather larger mingling of colours which only a person of lively imagination could regard as a landscape. It was, however, noticeable that while Mr. Uric's pictures presented a glazed surface, which might easily be concealed by chemicals, the so-called spirit paintings were coarsely laid down, so that the asperities could not well be covered over by a fluid. On the other hand, they were such wretched productions that any one might easily paint them in the dark without assistance either from Gainsborough or Michael Angelo.—*Glasgow Herald.*

Talk in the Studio.

ARCTIC PHOTOGRAPHY.—We have been favoured by Mr. W. A. J. Grant with an opportunity of inspecting a singularly fine series of photographs of Arctic scenery which he obtained whilst accompanying the *Pandora.* We shall return to the subject, as we have only space to remark at present that they are doubtless the finest photographs which have been taken in such high latitude.

MICRO-PHOTOGRAPHS AS AN AID TO THE STUDY OF PATHOLOGY.—A series of micro-photographs is announced as an aid to medical students to supersede copies drawn by hand of the enlarged images of the microscope. The work will contain normal and pathological examples showing the tissues in health and in disease. It is assumed that in many cases these will be more useful than the microscopic examination of actual tissues, as unless the student be a practised microscopist, he will derive more benefit from the easy and deliberate study of faithful photographs than from the image of the actual testing in the microscope.

SUICIDE OF A PHOTOGRAPHER.—We learn from the *Western Express* that a photographer at Budo, named Mr. Harry Thorne, recently committed suicide by cutting his throat. He is described as an able photographer, highly respected in the district.

ELASTIC DAMMAR VARNISH.—An elastic flexible varnish for paper, which may be applied without previously sizing the article, may be prepared as follows:—Crush transparent and clear pieces of dammar into small grains; introduce a convenient quantity—say 40 grains—into a flask, pour on it about six ounces of acetone, and expose the whole to a moderate temperature for about two weeks, frequently shaking. At the end of this time pour off the clear saturated solution of dammar in acetone, and add to every four parts of varnish three parts of rather dense collodion; the two solutions are mixed by agitation, the resulting liquid allowed to settle, and preserved in well-closed phials. This varnish is applied by means of a soft beaver-hair pencil, in vertical lines At the first application it will appear as if the surface of the paper were covered with a thin white skin. As soon, however, as the varnish has become dry, it presents a clear shining surface. It should be applied in two or three layers. This varnish retains its gloss under all conditions ot weather, and remains elastic.

YELLOW SPOTS ON PRINTS.—The Editor of *Anthony's Bulletin*, referring to the suggestion that the use of acetic acid was a cause of yellow spots, and reproducing our remarks on the subject, says:—"Whatever may be the cause of the yellow spots complained of, it must be evident that they certainly could not proceed from the use of acetic acid with the first washing water. If any effect of this kind were due to a solution, it would necessarily exist all over the print, making an uniform stain, and would not be confined to spots. For the purpose of concentrating attention upon the discovery of the true cause, we wish to observe that for years we have used the acetic acid in the first washing water, and have never seen any symptom from which we could infer that yellow spots could possibly be produced by it."

To Correspondents.

D. C.—The negative you enclose is a carbon negative, and consists, of course, of gelatine and some colouring matter. 2. To obtain a carbon negative, you must first make a carbon transparency in the usual way, then print from this transparency the negative. 3. Then, if necessary, you can intensify by the application of a solution of permanganate of potash. You will find information on the subject in our last and other YEAR-BOOKS.

A. W.—Our own experience is not in favour of the use of violet glass for studios. Ordinary white glass admits all the rays, violet and others included, and the presence of the non-actinic rays as well as actinic is not in any way injurious, so far as we can judge from experience and theory.

REMBRANDT.—We have already published the particulars you require, but now repeat them. The "Carver and Gilder's Guide" is published by Kent and Co., Paternoster Row, price half-a-crown. We are not familiar with any other work on the subject.

G. A. H.—You will find full details of the manipulation of the coffee plates in question in our issue for July 28th. The full instruction for development would occupy too much space to give in detail in this column. Make a sixty-grain solution of pyrogallic acid in alcohol, and a similar solution of carbonate of ammonia in water. Add twenty drops of each to an ounce of water, and apply to the plate, which has been duly moistened When the details are well out, wash well. Then apply a two-grain solution of pyrogallic acid containing three grains of citric acid to the ounce, added to an ounce of which ten or twelve drops of a fifteen-grain solution of nitrate of silver, and apply until sufficient density is acquired. This is the mode of development roughly stated; but you had better consult the number we have mentioned.

M. A.—There are very many methods of making a substitute for ground glass for backing transparencies, which we have published from time to time, but which we cannot repeat here. The addition of a little zinc white to collodion will give you an opalescent film. The addition of a little white wax to a benzole varnish will give a semi-opaque film. A very good imitation of ground glass is obtained by a varnish made by adding thirty grains of gum mastic and ten grains of gum sandarac to one ounce of benzole and two drachms of ether. If you study the pages of the NEWS and our YEAR-BOOKS, you will find many other formulæ.

SILVER.—The term *genre* belongs to the French language, and is used in relation to a certain class of pictures because there is no English equivalent which precisely expresses the idea. A *genre* picture is one which depicts life and manners, scenes in everyday life, often of the quaint and humorous side of everyday life, domestic life, rural life, and scenes generally which depict life and character in their everyday dress.

BELMONT.—The lighting is very good.

G. MARK.—The preparation of a lease is the duty of a solicitor. Do not on any account undertake such a duty yourself without legal advice.

B. R. R.—The mounting of prints in contact with glass requires care, but there is no especial difficulty. There is certainly a charm about the results, detail being especially well brought out, and a liquid transparency given to the shadows which is very effective. There are different modes of going about the work: here is a plan described by Mr. Gulliver in one of our YEAR-BOOKS. The print for this purpose should be a little darker than usual, and fully toned, and, after well washing, put between blotting-paper for a short time, and when surface dry floated on the following solution made warm:—

Isinglass	5 grains
Gum arabic	1 grain
Water	1 ounce

A gentle heat will dissolve the isinglass and gum; then add one drachm methylated spirit, and filter. Float the damp print upon this, and then lay it carefully on a plate of quite clean clear glass, say patent plate. Now press out the superfluous mixture with a squeegee (or a piece of india-rubber tubing will do for the purpose), beginning at the centre of the print with a gentle scraping motion; then allow it to get thoroughly dry. The print will now have all the brilliancy of prints in water; and much detail will be visible that in the ordinary way would not be seen; and, no doubt, the print will be permanent, or have every chance of being so.

ALEXANDER COWAN.—Many thanks.

A. ATKINSON.—Very interesting. Thanks.

W. COLQUHOUN.—You will see an account in another column. Thanks.

T. TEDRAKE.—Thanks for paper, from which we make extract. Thanks also, in advance, for YEAR-BOOK communication.

R. FAULKNER, C. FERRANTI, and other Correspondents.—Many thanks.

Several Correspondents in our next.

The Photographic News, November 24, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Chemical Constitution of Guncotton—M. Janssen and the Royal Society—Photography as Evidence in a Court of Law.

The Chemical Constitution of Guncotton.—Some recent investigations made by MM. Champion et Pellet, upon the composition of pyroxyline, will not be without interest to photographers. Many have stated, and Professor Abel of Woolwich among the number, that the difference between the most explosive form of guncotton and that employed for making collodion consists in the former containing more nitrogen than the latter. Military and blasting guncotton, according to Mr. Abel, contains three atoms of nitrogen, and may therefore be aptly termed tri-nitro-cellulose; while the most soluble cotton, that chemist avers, contains but two atoms. The latter is almost completely soluble in a solution of alcohol and ether, and hence it constitutes a capital pyroxyline for photographic purposes. MM. Champion et Pellett whose names are well known as authorities on explosives, have lately analysed military guncotton, and do not seem to be quite in accord with Mr. Abel. Instead of containing three atoms of nitrogen, they make it out that the compressed Abel cotton has but two-and-a-half atoms, and they further state that this is the composition of several very good photographic cottons, which they have also examined. Thus the Russian guncotton of M. Carette, which possesses exceptional qualities as a constituent of photographic collodion, these gentlemen state, contains quite as much nitrogen as the military explosive manufactured by the Stowmarket Guncotton Works, according to Mr. Abel's patent. Some guncottons which the experimenters have themselves prepared also give these results on analysing, but it is different with a paper pyroxyline which was examined, and which, as we know, makes very good collodion. This, MM. Champion et Pellet admit, contains but two atoms of nitrogen against the two-and-a-half found in cottons proper. The inexplicable part of the matter is therefore apparently this: that they show that two pyroxylines may be perfectly soluble, and yet be differently constituted; to wit, the Carette guncotton and paper pyroxyline. The ordinary military guncotton in this country should not have more than twelve per cent. of its mass soluble, and if this is the case, it is, indeed, pronounced unfit as an explosive. Yet again, MM. Champion et Pellet affirm that this military and insoluble guncotton is of the same chemical constitution as perfectly soluble or photographic guncotton. There is something here that needs further experiment and explanation, for one can scarcely believe that the soluble and insoluble material have the same composition. One explanation of the discrepancies between the analysis of Prof. Abel and that of MM. Champion et Pellet, which strikes us as possibly being a key to the solution, may be the circumstance that the French chemists have not obtained a good specimen of the military guncotton manufactured in this country. As the material sells for two or three shillings a pound, it is necessarily very roughly prepared, and cannot be regarded in any way, in respect to chemical purity, as equal to that which chemists and photographers carefully prepare in their laboratories. This commercial product not unfrequently, it may be presumed, contains a goodly proportion of unconverted cotton, and if this is the case, the amount of carbon found upon analysis would necessarily be much higher, and the percentage of nitrogen less. Probably Mr. Abel's analysis was based upon a very pure product, carefully prepared under his own superintendence; and if so, there is ample ground for supposing that an examination of such guncotton, and the material manufactured in large quantities at Stowmarket, would give different results. One thing, however, is certain, that the subject cannot now remain as it is. The names of MM. Champion et Pellet are too well known to question the soundness of their work, while the reputation of the President of the Chemical Society is also beyond suspicion. We shall look with interest, therefore, for any explanation that can satisfactorily reconcile the analytical results of these gentlemen.

M. Janssen and the Royal Society.—We are glad to see the name of the French photo-astronomer, M. Janssen, among the Royal Society medallists this year. M. Janssen's solar observations are well known to the readers of the Photographic News, for his clever *revolver photographique* has earned him a wide reputation as an earnest and accurate observer. M. Janssen is to be presented with the medal "for his numerous and important researches in the radiation and absorption of light, carried on chiefly by means of the spectroscope," and it is hoped that he will be present at Burlington House, next Thursday, the 30th inst., to receive it in person at the hands of the President. Three other medals are to be presented on the same day' and one of them, the Copley medal, to another French *savan*, M. Claude Bernard, for his contributions to the science of physiology. A Royal medal is to be given to Mr. William Froude, F.R.S., for his researches upon the behaviour of ships, their oscillations, their resistance and propulsion; and another medal of the same nature to Sir G. Wyville Thomson, F.R.S., for his successful direction of the scientific investigations carried on by H.M.S. *Challenger*.

Photography as Evidence in a Court of Law.—A charge of murder against a Frenchman naturalised as a British subject has caused some little stir in the journals of late. He is charged with throwing his wife over a precipice on the Stelvio Pass, and the matter has now been adjourned for some particulars which are to come from Vienna, and for the further photographs of the spot where the murder is supposed to have been committed. We are personally familiar with the mountain road where the murder is said to have been committed, and if the photographs are only properly taken they will, to our thinking, be material witnesses. The Stelvio Pass is the highest carriage-road in Europe, being nine thousand feet above the sea, and consequently, the summit of the Pass is a thousand feet above the snow line. The very top is a cutting between two rugged mountains, and the road is scarcely ever free from snow. It is a most desolate region, and has no friendly hospice like the St. Bernard, the Simplon, the St. Gothard, &c. There is a rough building serving as a temporary shelter for road wanderers, nothing more. A little while ago there used to be an Austrian posthouse just under the top of the Pass, where horses were to be hired, and travellers might obtain shelter and refreshment; but one day an avalanche came tumbling down the mountains, and the huge masses of ice and rock smashed the fragile little house to atoms and killed every being in the place; the postmaster himself, poor fellow, being found under a bit of rock that a dozen men could scarcely move. Now, the nearest inhabited tenement on the Austrian side is a couple of thousand feet from the summit, at the place called Franzeshöhe, where there are half-a-dozen beds and as many ovens for warming the traveller. It is between this house and the top that the murder is said to have been committed. The road during the last part of the ascent winds in a series of zigzags over what may be termed a monster earth-shoot. The road, probably, makes twenty of these zigzags, ascending steeply over the soft shaky soil, and it is part of the road that Austrians find so difficult to keep in repair. The rain and torrents sweep the loose earth away every spring and summer, and a large staff of roadmenders are continually engaged in mending the route. In parts the side of the road is very steep indeed, but in others, though the banks are precipitous enough, it is possible to make one's way down direct with the aid of a pole, cutting from one zigzag to another in the same way as you might run down a snow slope. There is no danger so long as you are careful of your footing. Next to personally inspecting such a road, photographers will be able to convey the best idea of its nature, and for this reason we were very glad to hear that such productions had been asked for, for the purpose of the trial. Pictures executed from a good standpoint, and properly taken, would be exceedingly valuable in confirming, or otherwise, the accounts given by the witnesses or the prisoner.

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BEECHEY PLATES AND THEIR WORKING.

BY ST. VINCENT BEECHEY.*

Seeing you have no subject on your notice paper for next Thursday's meeting, I have thought you might like a line from your old President on his work at the lakes during the October holidays. It is seven years since I was there before, and I felt like a schoolboy going home when I drove from Keswick to Leatoller, in the heart of Borrowdale, with my wife and servant, and a good batch of the Beechey dry plates.

About the latter I was not a little anxious; for, acting upon my own advice to make fresh plates just before starting, I took down my stock-bottle of bromide solution, quickly converted some into emulsion, and the next night prepared two dozen plates (all my drying-box will hold). I lighted my little spirit lamp under it and was going to bed, but, fortunately, remembered some writing I had to do, for in about an hour I perceived a strong smell of burning. I opened my *atelier* door, was greeted by a cloud of smoke, and found my drying-box on fire. The spirit lamp had been too near the sheet-iron bottom; the alcohol had got hot and evaporated, and set fire to the box. I succeeded in putting it out before much damage had been done, but how about my plates? They were too hot to hold! Were they spoiled? I had neither time nor weather for trial; but I made a second batch all right in case. I took developing material with me, and on the first fine day tried a picture. Expecting the sensitiveness of the plates to have been injured, I gave three times my usual exposure, and, to my delight, I got an excellent negative. Indeed, all my plates have proved extremely good, beautifully clear, and exactly like wet plates.

And now a word about the speciality of these plates. They are absolutely certain. Only give them exposure enough if you have plenty of time, and, however dark the day, you yet a good picture. I greatly prefer over-exposing, because by a weaker developer the picture comes out gradually, and even fuller and fuller without forcing—plentifully dense without redeveloping—perfectly clear without a trace of fog—and when fixed they have the bloom and beauty of wet plates.

If, however, you give under-exposure, you can force out the picture in a marvellous manner, but you ultimately lose the wet-plate quality, and get a black film with, in extreme cases, fog, but still a good printing negative.

But now I am going to tell you of a circumstance but for which I am not sure I should have written this paper; for it relates to a phenomenon which I have never seen treated on before, and tends to show, I think, beyond doubt, that the action of light upon the bromide film, if not altogether electric, is greatly modified by electricity. In developing my plates I use an india-rubber holder with a wooden handle. On two occasions, when trying to force out plates exposed upon a dark ravine and waterfall on a gloomy day, I put the holder on the back of the plate the wrong way for my hand. Instead of loosing it and putting it on again right, *I screwed it round* whilst tightly holding to the glass. Well, at first the picture came out slowly, and I knew it was under-exposed. I forced it with repeated doses of ammonia, and I saw it fog at last, on which I stopped and cleared it, and got my picture; but lo! in the centre it was perfectly clear and bright, whilst all round the centre it was fogged equally, leaving a circle the exact size of the holder on which no deposit of fog had fallen! I fear my drawing will scarcely show the picture. It is meant for a rocky and wooded mountain torrent, with large stones in front and near the fall; but I think you will understand the effect by noting the light circle with the waterfall in it. I have turned the negative into a positive, or you would never make out what I mean. Now, as this effect took place in both the plates on which I screwed the holder round, and on none others, I feel sure the friction of the india-rubber on the glass gave an electric surface to the centre piece, of different tension to the outer parts of the plate, and so caused less deposit on that part than on the rest of the plate. Explain the effect to me in any other manner if you can.

I am very sorry to add that we only had two fine days during my three weeks' holidays, and so I only exposed the over-baked two dozen plates; but I got nice pictures of Coomb Waterfall and Old Mill, of our old friend the Bowden Stone, and some bridges and rocks, &c., which are pretty and good. But I really cannot speak too highly of the plates, which are nicer and more certain and equal than any I ever worked with.

I am pleased to see a good report of these plates in connection with the Liverpool Amateur Photographic Association's meeting, and heartily wish some of my Manchester friends would try their hands on the chloro-bromide emulsion, made according to my exact formula.

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CARBON PRINTING IN AMERICA.

Messrs Allen and Rowell detail their experiences in carbon printing in a communication to the *Philadelphia Photographer* as follows:—

"A few words for you on carbon printing. For the past year we have been in receipt of letters asking us many questions with regard to our manner of working, and if we were successful in printing our work in carbon. We have for the past three years made all our work, from six and a half by eight and a half inches to thirty by forty-five inches, in carbon, and there is certainly a satisfaction in giving a customer a permanent picture, and knowing it will not be brought back to you with the question, What is the matter with our picture? What causes these yellow spots? &c. We have thought best, therefore, to give our method of making transparencies and prints as follows:—

Cox's gelatine	½	ounce
Water	10	ounces
Chrome alum	10	grains
Water	1	ounce.

Dissolve gelatine; add chrome alum gradually, stirring briskly; while doing so filter through muslin or Shaker flannel; coat clean glasses with the warm solution, place in rack to dry, taking care to keep free from dust. A quantity may be prepared, as they will keep any length of time. Negative must be masked with a half-inch margin, to keep that much tissue from being acted on by light which forms what is known as a 'safe edge;' place tissue on negative, and print in shade from one to two hours, according to density of negative; then take tissue out of frame, clip down to a glass, or pin down corners to a board, or turn up edges to form a dish, and coat with plain collodion, three grains cotton to ounce; let dry, then immerse tissue and glass in a dish of clean water till tissue begins to straighten out; lift out glass with tissue on it on to a glass or board, and secure contact between the two surfaces by using a rubber scraper or squeegee, placing a piece of rubber cloth over the tissue to protect it from the scraper; leave to dry twenty or thirty minutes; beginners generally hurry this too much ; then develop in clean water , 90° or 100°, increasing in warmth if necessary, to make the paper peel readily off ; wash off all soluble colour, rinse with cold water, then in alum water, again in cold water, and put to dry in a cool place free from dust, as every speck of dirt will be enlarged in the negative ; place transparency in enlarging camera, film side to lens, to make a reversed negative for carbon printing ; the reverse way if for silver printing. Negatives for carbon printing should be vigorous and clear in shadows. To make a single transfer print, take your reversed negative, place tissue over it in frame, expose to light ; no definite time can be given, as it is much more sensitive than printing in silver ; immerse your print in water with a piece of single transfer paper, which is a paper coated with gelatine and chrome alum ; get the two surfaces together under water, remove to a glass slab, use squeegee to secure perfect contact and remove air. Do not be afraid of rubbing it too hard. Beginners usually fail in this also. Blisters will result from imperfect contact, whether caused by air or dirt between the two surfaces. Develop in the same manner as for transparencies.

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* Read before the Manchester Photographic Society

ON VARIOUS DISTORTIONS IN PHOTOGRAPHY.

BY W. CURTIS TAYLOR.[*]

As fellow-members of an arduous profession, having aims and trials in common, it is fitting that we should seek a mutual understanding on such of our affairs as are most exposed to public criticism. I have selected one of these to which reference is often made, and in treating it shall leave the fabric of my remarks so open at all sides that you may add to it or take from it, or even pull it to pieces, to suit yourself ; my object being to elicit discussion and to secure a reasonably harmonious attitude in the presence of our critics.

In dealing with so-called distortions in photography we are compelled, at the outset, to divide them into two classes, the real and the imaginary. Let us give the latter our first attention.

Every one is familiar with the fact that a marked peculiarity of feature is apt to be more conspicuous in an unfinished photograph than in nature. Not one face in a thousand, to speak critically, is in perfect drawing, and by so much as it fails of this does the untouched photograph seem to make the worst of it. When this is the case with a subject that has been well posed, it is due, I think, to our habit of comparing all portraits with ideals rather than with the realities of the human face. The origin of these ideas is very mixed. Some persons have no aptitude for comparison, and are not good judges of likeness at all. Again, we are all blinded more or less by the partialities of friendship and affection, and, in regard to his own likeness, every person is notoriously at fault. Lastly, artistic ideals insensibly tinge our perceptions of the true drawing of features. I am disposed to think that many ill-founded charges of error come from the last source.

The first duty of imitative art, we should naturally think, is to represent nature truthfully, then agreeably. But the exactions of taste, not to say the demands of trade, have somewhat disturbed this order, and the artist is often induced to be exact only so far as exactness may be pleasing. In other words, portraiture, in order to be popular, must represent its subjects not altogether as they are, but as they want to be. Now, except as we call in the pencil's check, it happens that we are bound to more unyielding results than the painter experiences. In drawing a nose or an ear, a hand or a foot, the painter may, if he choose, make it two-thirds its natural size (and he often does), and his subjects will usually shout "Bravo!" over his "keen perception of the beautiful." But if a luckless photographer plant the precious first baby in a chair with its foot not artfully placed, the camera will not lie to please anybody ; and our miserable friend will be told in the presence of his best customers that he has made a disgusting failure. That baby, above all others ever born, has a little foot, and he has made it look like a bake-iron, or a grain-shovel! Moreover, Mr. Rodomontado painted baby's little cousin, who has an enormous foot, and he made it "as small as your two fingers." All which is likely enough.

Although such an extreme case is not of daily occurrence, it is real enough to point my meaning ; and since the hard facts of proportion will not vanish at the bidding of the dear public, concerning the dealing with the whole class of such complaints, we can only commend each photographer to the guidance of his own experience. Perhaps we ought oftener to exhibit the candour of a friend of mine, to whom a lady complained that he had made her mouth and eyes all aslant. He promptly marched her to a mirror, and with rule and compass showed her that his camera had told the truth. Under the momentary conviction she exclaimed, "Bless my soul! I never knew I was so crooked." But doubtless she afterwards justified the couplet of Hudibras :

"A man convinced against his will
Is of the same opinion still."

I have already hinted at the distortion that takes place when the extremities of the body are placed relatively too near the camera ; but just here I want to drop an earnest word. Too much is not to be yielded to the popular idea of defectiveness from this source. With reasonable care in posing, an instrument at a proper working distance from the sitter will not sensibly violate the real demands of perspective, which every artist, mark you, ought to observe. I have made this a matter af experiment, and I hope all practical workers in our profession will satisfy themselves to the same effect, so that they may have reason for opposing the idea named, being sure that variations in proportion, due to perspective, are not among our peculiar difficulties.

We come now to another class of defects, which are not veritable distortions, though they are sometimes so accounted ; I speak of those that arise from injudicious lighting.

It would carry us into an interminable range of topic if we were to consider the whole artistic bearing of light and shade as it enters into expression, and I must pause to remind myself as well as you that we now confine the idea of "distortion" to the real or apparent change of the absolute proportions of face and figure.

From the familiar experience that white or light coloured objects contrasted with dark ones of the same size are not only more obtrusive but actually appear larger to the eye, it is reasonable that lights falling upon the various parts of the face have an effect additional to the giving of height or prominence to those parts, and must make them look intrinsically larger by mere virtue of their light tint. How deftly, then, must the careful photographer humour the nature of his subject in lighting them up! It would damage his reputation to let the light play recklessly on those staring high cheek-bones ; on this nose flattened at the bridge, or with a ball at the end ; or on these hard lantern jaws.

Reverse what has been said about injudicious lighting, and apply it to shading, and by the counteraction of the same law we have sunken eyes, hollow cheeks, scowling forehead, pouting lips, double chin, &c., all asking to be treated as if they had no existence in actual life.

So far as we have now gone there are almost no distortions of actual drawing in either of the cases named ; the ill effects, practically speaking, are those which would be presented to the eye in the given situations were there no such thing as photography.

I am thus earnest in urging the disallowance of indiscriminate charges of distortion, because that term carries with it an idea of unavoidable error, in a mechanical sense, which I insist does not belong to any of the difficulties we have been considering.

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[*] Read before the National Photographic Association, U.S., and reported in the *Philadelphia Photographer*.

We have now to refer to a complaint which is hard to classify, unless we put it under the head of pure imagination. Probably all photographers have had very good pictures objected to because they were thought to represent the person larger or smaller than natural size, usually larger. This puzzling objection is oftenest made with children's heads. When I was new to the business no criticism so completely amazed me as this. Here is a child with a head as big as a cantaloupe, and here is a vignetted head the size of a cherry, and to the parent the vignette looks bigger than the child. If it were a figure picture you might account for such judgment by the relative sizes of the accessories, but why the head, and that with a good large margin?—and yet it is insisted that it looks too large. Well, I am puzzled, but not my objector. He or she knows all about it. "Photographs, you know, exaggerate so." But this is just the size you selected for the head." "True, but somehow this makes the child look twice as large as he is. I have a brother who is quite an artist, and he says that photographs always exaggerate the features."

Unanticipated and unreasonable as all such criticism is, we will pardon it if only it will not attack the accuracy of our art so unjustifiably.

The last on our list, unlike the foregoing, is a veritable and confessed distortion; but it is simple truth to say that it is not chargeable to photography, but to papermaking. The unequal stretching of paper, though, as a rule, but little observable, sometimes becomes a genuine difficulty. As our photographic paper is usually furnished, it will be found when mounted to show an excess of stretching, widthwise, of the sheet, equal to one-fortieth on any given length. As we usually cut for printing, this shows itself lengthwise in the card 4-4 and 8-4, and widthwise on the cabinet and promenade, as in the full sheet. It is probably within the truth to say that the majority of 8-4, 4-4, and card heads, as given to the public, are too long by as much as the width of their respective eyebrows.

To make this effect more obvious to our manufacturers, on whose shoulders we roll this difficulty, I have prepared two enlarged heads of our admired friend Don Pedro from the one negative I was able to get from life. These are enlarged by two processes, each enhancing in opposite directions the effect spoken of, so that the inaccuracy from unequal shrinkage of paper is here shown with fourfold power, to exhibit how it works. The degree of the effect is this divided by four. Will our manufacturers please see if they cannot run the fibres of their paper in a non-uniform direction, and thus relieve us, as well as lithographers and engravers?

It is well to reflect, however, that this evil is not without its compensation, in giving us the opportunity to change the effect of a negative in latitude and longitude.

Strange to say, while there are so many suspicions of photographic distortion, this one has escaped a general recognition among the public. Let it be a secret between the manufacturers of paper and their customers in the arts.

And so concludes an imperfect enumeration of certain effects which have to be avoided by refined photography. That they are so well and so generally avoided testifies to the untiring skill and care of large numbers in our profession. Now, if you will let me reverse the usual order, I will name my text at the end of the discourse, and it is the same as that which I had the honour to enlarge upon in "Photographic Mosaics" for this year, viz.—photography, like the other imitative arts, while it employs mechanism, is not in bondage to it.

After dwelling, as we have, on the perversions, real and imaginary, whose effects have to be subdued, we may assert before the world that all these and worse would mark your work if you were not sincere co-labourers with art. And by all that your pictures are above what simply mechanical pictures would be, do you emphasize your triumphs in yonder hall.

So far from being bound, Ixion-like, to the wheel of unsympathetic machinery, you have in a worthy degree directed to your purposes the forces of both nature and art, and a noble commission in this world's jubilee recognizes your achievements in devoting to you an ample edifice and a distinguished place among the highest refinements of taste and skill. What more can you ask? Or, asking more, what better incitement to continued progress can you possibly have?

DR. VOGEL ON EDER AND TOTH'S IODIZERS.

In his correspondence in our Philadelphia contemporary Dr. Vogel says:—

"It has often been noticed that the number of physicians and chemists engaged in photography is proportionally very small, and that they are not at all active in promoting the progress of photography to such a degree as they might. Therefore it is very pleasing to hear that two chemists, Eder and Toth, at Vienna, have devoted themselves to the investigation of the chemical part of photography. We are already indebted to them for an excellent work on lead-strengthening, about which I have formerly reported. Recently they have published a superior work on iodizers, in which they have proved that there are existing certain double salts, such as iodide cadmium and iodide calium, iodide cadmium and iodide ammonium, &c., which, on account of their solubility, stability, and easy preparation, are especially suitable for the iodizing of collodion. They recommend as being preferable the double ammonium cadmium iodide and the single ammonium cadmium bromide. The formula of the first is: $2NH_4I + CdI + 2H_2O$. Of the second: $2NH_4Br + 2CdBr_2 + H_2O$. Collodion iodized with both of these salts shows, besides the utmost possible sensibility, a great durability, which can be increased by adding more cadmium salt. Although this reduces the sensibility, yet we may increase it again by adding more ammoniac salt, which lessens, of course, the durability.

"For the most sensitive collodion, Eder and Toth recommend bromide ammonium, together with their double ammonium cadmium iodide. By their formula the following would be the best for portraits: 3 grammes bromide ammonium; 28 grammes double ammonium cadmium iodide; dissolved in 500 cubic centimetres of alcohol, filtered and mixed with 1500 cubic centimetres of plain collodion, which, in 100 parts, contains 2 parts cotton.

"For normal collodion, which is not quite as sensitive, but more durable, they recommend the following: 7 grammes double ammonium cadmium iodide, 1 gramme single ammonium cadmium bromide; dissolved in 120 cubic centimetres of alcohol, and, after filtering, mixed with 360 cubic centimetres of plain collodion, and 2 per cent of cotton. This can be specially recommended for landscapes.

"Eder's double salts have already appeared in trade; A. Moll, of Vienna, is preparing them, and I can but recommend their application. But if they cannot be obtained there, any photographer can prepare a similar collodion by means of salts easily purchased. For portrait collodion take: 3·6 grammes iodide ammonium (fresh and dry); 4·5 grammes iodide cadmium; 1 gramme bromide ammonium; dissolve in 140 cubic centimetres of alcohol, filter, add add 420 cubic centimetres of plain collodion.

"There is no difficulty in preparing the double salts. To produce double ammonium cadmium iodide, dissolve 145 parts iodide ammonium and 183 parts iodide cadmium in water, and evaporate till it crystallizes. It crystallizes quite easily in slightly distorted cubes, and can be freed from the yellow mother lye by pressing. If you wish very clean salt, you will have to crystallize it again.

"The single ammonium cadmium bromide is prepared by dissolving 344 parts of crystallized bromide cadmium and 98 parts bromide ammonium in water, evaporating till crytallization; the latter may also be repeated.

"Eder and Toth have rendered good service in other work besides the above, and photographers may well be proud of having now these two men, who evidently have an earnest desire to assist in the furtherance of the art."

CO-OPERATIVE PHOTOGRAPHY.

BY E. K. HOUGH.*

For more than twenty years in this country photography has been so prosperous that workmen everywhere, with any respectable degree of skill, have been sure of remunerative employment. But during the present continuing hard times there has been a tendency to close up the ranks, and force out those who have not developed a large degree of special skill in some department. Galleries narrow down their working force to a small complement of picked men, and then cannot always keep them busily employed. Proprietors themselves often have to struggle with desperate energy to keep their foothold; and, if not compelled to close their doors, have much sacrifice and humiliation forced on them.

Now, although we must admit that in the end photography, as an art, will be benefited through this severe process of natural selection by the survival of the fittest, yet I think it no less true that by a little judicious management, many who would otherwise be submerged and lost could save themselves from a prolonged and desperate struggle with great mutual advantage, and therefore any sensible suggestion to that end may be called practical. If I am right, the means of rescue may be expressed in two words, co-operative consolidation.

The great mistake, especially in all large towns, would seem to be the endeavour to keep in existence too many small galleries; none of them large enough to afford or contain all the superior modern conveniences and improvements, yet all too large to be profitably conducted without them.

The co-operative method of encouragement, by participation of profits, has been so rare that most of the ambitious and progressive young men who have developed any important degree of skill, by working in large galleries, have felt compelled to commence business for themselves instead of working on for wages. And although starting in small ways, with imperfect experience and facilities, they have generally been satisfied, because more prosperous and independent than when on salary.

But now the hard times squeezes them. We all know that the expense of keeping a gallery open and ready for business, in dull times, very nearly equals the expense of busy times; that after these first necessary expenses are paid, the excess of business is very largely profit; that to keep three or four small and poorly-furnished galleries running costs twice as much as for one large and well-furnished gallery, wherein the best workmen from the four could do twice more work than in all of them combined, and twice as good work as in either of them singly, with more satisfaction to themselves and customers, and far more money profit.

More than this, the most of these small galleries are run upon the strength of one qualification. The proprietor is either a pushing business man, a good skylight worker, or a good chemical manipulator; and with this one chief qualification he starts a gallery. And thus hundreds have succeeded, too; so sure is it that even one thoroughly good quality will always secure appreciation.

But as photography is now conducted, it requires such diversified talent that the work of every important gallery might be divided into four departments, each of which should have for its head a man not only well trained and experienced, but with something of peculiar taste and genius for his special work.

First in order is the business department, which should include the entire financial management of the concern, the purchase and sale of everything used or produced, the reception and delivery of all orders, the only authority to make promises, and, when made, the entire responsibility to the public for their fulfilment; in short, being the responsible managing medium between the interior artistic producers and the outside paying customers.

Second in order, but first in importance, comes the positionist—the skylight man—the artistic soul of the establishment, wherein the financial manager represents the brains; the spiritual, in contrast and conjunction with the intellectual. While financial success depends most on the business management, all the pride and glory of the establishment depend on the spirit and power manifested in this artistic department. If the spirit ruling here is tame and common-place, there can be no large business and no great fame.

Third in order, but of great importance, comes the chemical management and manipulations, dealing with material forces of the most delicate and variable character, requiring most careful control to maintain that trembling balance of conditions most favourable to fine results.

Lastly come the printing and finishing, which require a high degree of mechanical skill and artistic taste, to attain the best effects with uniform excellence.

The chemical and printing departments are only subordinate to the business and artistic, because they deal with fixed material elements instead of intelligent living forces.

The diverse talent required for excellence in each of these departments will rarely or never be found combined in one person. A man of superior business qualities will rarely be above average in artistic, as also a man with great artistic ability will never excel in business talent, nor often be superior in chemical skill. Also each of these departments in a large gallery requires sufficient care and ability to occupy the entire time and thought of any one man.

Therefore, in seeking to combine all these diverse but necessary qualities under one business management, I believe some system of co-operation would be better than partnership, and more reliable than wages. It would give scope for all the enthusiasm of the young and enterprising, would enable those of small means to combine far greater business facilities under less running expense, and would be largely free from hampering complications.

This paper is, of course, intended as merely suggestive in calling attention to possible co-operative advantages, and offers no ready-made method of procedure.

And finally, although co-operation in photography may never be generally practised, I believe it is decidedly practical.

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* Read before the National Photographic Association, U.S.

Painting Glass for the Magic Lantern.—Draw on paper the size of the glass the subject you mean to paint. Fasten this at each end of the glass with paste, or cement, to prevent it from slipping. Then reverse the glass so as to have the paper underneath, and with some very black paint, mixed with varnish, draw with a fine camel-hair pencil very lightly the outlines sketched on the paper which are reflected on the glass. It would add to the resemblance if the outlines were drawn in the colours of the object; but in this respect the artist must please his fancy. When the outlines are dry, colour and shade the figures; but observe to temper the colours with strong white varnish.—*Scientific American.*

The Photographic News.

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SOME TEACHINGS OF THE EXHIBITION.

The exhibition which has just closed has been less fertile in the usual lessons of an exhibition of photographs than most of those which have preceded it. It contained many very fine pictures, and much that was interesting to visitors; but it contained less novelty of any kind—technical and artistic—than any exhibition we remember to have seen in connection with the Society. Of technical novelty it contained absolutely nothing. Herr Warnerke's sensitive films, negatives and other results from which were exhibited, were the invention of the year before. There were several fine examples of artistic photography, but none of such a novel or startling quality as to exceed the productions of all former years. There was nothing suggesting a "new departure" in the art. As regards the attendance and the monetary results, we have at present no information, but we shall feel gratified to learn that no loss has been sustained by the Society.

We may say at the outset that we do not in our remarks impute intentional laches, or attempt to fix blame on any one. The duties of arranging and managing an exhibition of this kind are no light ones, and they are undertaken solely as a labour of love. The task under the best conditions is not easy. Exhibitors and visitors alike claim a right to find fault, and the Society will scarcely be satisfied unless the project prove, if not a monetary success, at least a scheme which involves no loss. The time for actual arrangement—such as hanging, cataloguing, &c.—is very brief, and despite every effort some contributors will persist in sending late, often pictures of such excellence that it seems impossible to the committee to exclude them. We know something of the actual trouble and anxiety attaching to the office of an exhibition committee, and would bespeak every consideration for them in referring to the shortcomings of the exhibition, or any share which the arrangements may have had in militating against success. The chief source of failure, so far as arrangements have affected the matter, has arisen from inexperience. New projects have been tried, which more experience would have checked; and the result of each novelty has been disastrous. We have no intention of recalling the somewhat acrimonious discussion on the subject which arose some weeks ago. The "Country Photographer," in his earnest and straightforward letter, doubtless indicated some of the main causes of trouble. The vaguely personal letter signed a "Member of Council" added nothing to the controversy except in so far as it elicited the dignified letter of Mr. Vernon Heath, confirming the allegation of the Country Photographer as to the prohibitive effect of the early date at which the exhibition had been held; and some trenchant remarks from other correspondents.

As our object here is solely to consider evils which can be remedied, we shall not enter into other considerations. The disruption in the Society doubtless cooled the zeal and interest in its welfare of many. But it is past, and the only consideration is now how to heal the wounds it caused. It is probable that some of the prime movers in that mistake now regret it as heartily as anyone. Time will probably prove the best healer. In the meantime, as regards the exhibition, which is perhaps the most valuable apanage of the Society, the question is how to ensure its success; or, at any rate, prevent its degeneracy. A few moments spent in glancing at exhibitions of the past may aid us in this. Going back to the earliest years, the first exhibitions of the Society, when the art was still a novelty patronized in fashionable life, were successful; but this did not last long. The expenses soon began to exceed the income, and for several years the exhibitions were a very heavy drain upon the funds of the Society. Having regard, however, to their great value, they were continued for some time at this heavy loss, until the Society became too much impoverished to afford to maintain them, and they were discontinued. After a cessation of some years, it was resolved by the Council of the Society, in 1867, to ask members to exhibit, at the opening meeting of the winter session, held in November, the results of their summer's operations; to hold, in fact, what was termed an exhibition meeting, in place of the ordinary meeting of the Society. The response to this invitation was most gratifying. The contributions were only sent in a few hours before the meeting; but, by the voluntary exertions of a few members of the Council and a carpenter, the walls of the Conduit Street Gallery were covered with the pictures by the time the meeting opened. The exhibition was an excellent one, and but one drawback caused common regret—the fact that such a fine collection of pictures should be shown for one night only. Before the evening closed, however, the secretary, Dr. Diamond, had consulted with the Editor of this journal, and they resolved, on their own responsibility (as no council meeting could be called), to keep the exhibition open for a week, and this was done, to the satisfaction of every one. The following year the exhibition was opened at the outset for a week, and in subsequent years for still longer periods. The first few of these revived exhibitions were opened to the members and friends alike gratuitously; but by dint of very careful management they were conducted so as to be a very small cost to the Society. Subsequently a charge was made to non-members, and some profit, rather than a loss, followed. In number of exhibitors, number of contributions, and the great excellence and interest of the work, the majority of these exhibitions attained the highest success, and were full of interest. Last year and the year preceding there was a falling off, and this year the falling off in contributions and contributors, and we fear also in visitors, is so marked as to demand serious consideration to determine, if possible, the causes and remedy.

In the first place, it was opened much too early. Few photographers can with convenience have their most recent and best work ready by the end of August, especially if they wish it to include, as it should, the cream of their summer's work. Even if photographers could without inconvenience send in their contributions so early, a very large number of the public who would attend the exhibition are out of town, fashionable London being empty in September. The argument used in favour of opening the exhibition at this early period is, that the gallery can only be obtained at that period. But this year the exhibition was kept open nearly ten weeks, from the beginning of September to the middle of November. If it had been kept open for half that time, commencing in October, it is probable that an equally large number of visitors would have attended, whilst it would have given contributors a month or five weeks later period for sending in, and have saved some expenses.

The announcement that inscriptions of any kind upon pictures or frames would not be permitted was a fatal error, and caused dissatisfaction alike in its observance and breach. It robbed the exhibition of much interest to every visitor, and robbed it of much value to the exhibitors. The name of the exhibitor and title of the picture upon each mount or frame should, instead of being prohibited, be enforced. Nothing is more tiresome in visiting an exhibition of this kind than the necessity of constantly referring to the catalogue, a process which destroys all deliberation in examining the pictures, and generally issues in half the number, at least, being passed over without any reference to the catalogue, and the exhibitors' names remain unknown. At the National Gallery, now one of the finest galleries of paintings in the world, every picture has the name of the artist and of the subject legibly painted on the frame, rendering the examination a comfort as well as an instructive pleasure. Considerable licence in placing name, subject, description, or motto on each picture, might with advantage be allowed, with also the injunction that the inscription should be neat, and an intimation that advertisements, or loud, vulgar inscriptions, would disqualify a picture for exhibition. If the catalogue could be made more complete by fuller descriptive details, it would greatly increase its interest.

The system of hanging at present adopted seems to be manifestly unsatisfactory, if we may judge from the comments of some of the most esteemed and experienced of the exhibitors, from many of the visitors, and from correspondents We refer to the system of spreading about the contributions of each exhibitor, so as to form a general harmonious distribution over the walls, to the detriment of the contributor, and frequently to the confusion of the visitor anxious to estimate the characteristics of the work of each contributor.

The evil to which Mr. R. Manners Gordon referred in a recent letter in our pages requires a remedy. Whilst Mr. Gordon was in Madeira, some one, doubtless with the best intentions, sent in for exhibition some old prints produced by him many years ago. The prints are dingy and faded looking, and certainly not such as Mr. Gordon would now exhibit; but, so far as the public know, they are exhibited by him, as no explanation to the contrary appears in the catalogue. From the private note accompanying this letter we learn how deep is the annoyance felt by Mr. Gordon, although his desire to avoid giving pain gives only mild and courteous expression to his annoyance in his letter sent for publication. Possibly a rule requiring that the contributions shall be the work of the past year might meet the case; or a rule stating that in all cases the name of the exhibitor, if other than the producer, shall be published in the catalogue, so that the photographer may not be injured, nor the public misled.

Finally, it is very desirable that facilities should be offered for photographers disposing of the pictures exhibited. There is to the Society a risk and trouble in packing, and cost in carriage to the contributor.* Both these might be saved if the picture were sold. As a recent correspondent pointed out, many country exhibitors would gladly dispose of their pictures at low rates rather than pay the cost of carriage home, and residents in town would often be glad of the opportunity of acquiring specimens they had admired. We do not enter into details, but we are satisfied that an improvement in this matter might be effected.

There are other minor improvements which might be made, but we have indicated some of the principal evils which militate against the exhibition giving satisfaction and securing success.

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APPLICATIONS OF PHOTOGRAPHY TO THE CULTIVATION OF SCIENCE, ARTS, ETC., IN FRANCE, AS EXEMPLIFIED BY THE RECENT PARIS EXHIBITION.

BY M. A. DAVANNE.*

A special department of the Academy of Fine Arts at Paris has been organized, under the name of *Commission des Monuments Historiques*, for the double purpose of superintending the conservation and restoration of diver monuments interesting in the history of France, and to collect documents necessary for a study of these.

To do this, photography is especially suitable, unless the locality in which the monuments are found do not permit the use of the camera. Better than any other method of reproduction, it can indicate, in the case of every monument, the *ensemble* of its situation, the view from different points, the important details, and the portions to be restored, while at the same time it presents an easy plan of multiplying projects and architectural plans, and for proving the extent to which a work has been proceeded with, &c., &c. The art permits us, moreover, to unite in one splendid collection all the scarce monuments, and allows us to classify, in a facile manner, the periods, styles, &c.

The *Commission des Monuments Historiques*, although it was unable to contribute to our exhibition but an imperfect collection, has been successful in completing a series of four thousand photographs which those interested in architecture and archæology may consult at the *Academy des Beaux Arts*. Unfortunately, the whole of this large collection of pictures, or nearly all, are not of a permanent character, having been printed by the silver process. Moreover, they are not the result of uniform work, but have been collected from all and every source; the consequence being, that if they include many fine examples of the art, they also number some of a very inferior character.

It seems to me that in carrying out a task of this nature, where the collection of pictures is of some importance, the *Commission* should have made some sacrifices, and attached to itself a few excellent operators to do the work they require to be performed. They should have been the owners of all the clichés produced, and these having been stripped from the glass by any of the known processes are easily taken care of in the leaves of a register. They could have printed as many copies as they desired, and choose such methods of printing as are most permanent, so that they might more perfectly fulfil the conditions of the task they have set themselves.

We here see the necessity once more of Government creating a photographic establishment specially connected with education, which might perform duties connected with many branches.

In medicine, natural history, botany, entomology, we find everywhere the same disposition to replace other means of record by photography; and the advantages possessed by a picture which is simply a reflex of the original object, over one prepared by hand, need not, of course, be dilated on.

The Exhibition was especially rich in micro-photographs, which demand for their production special study and skill. We may mention, among others, the fine pictures exhibited by Dr. Luys, representing the brain in a state of health and disease; as well as his pictures of the texture of the brain, the movements of the pulse, &c. M. A. Girard showed us how photography could be applied to assist the paper manufacturer, and shows how different textile fibres may be represented by its aid; while M. J. Girard shows the application of the art to the science of crystallography. Finally, M. Ravet applies the camera to tell, us something more definite of the troublesome phylloxera and the various species of diatoms, which are reproduced with such clearness that an enlarging power fifteen thousand diameters leaves lines which are perfectly sharp, and shows details that the eye could not master with the aid of the microscope alone.

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* Our aim in these hints has been to confine our remarks to general principles and avoid individual grievances as much as possible, of which many have been brought under our attention. But to give point to this question of sending home pictures, we will quote a letter from one distinguished photographer. Referring to last year's exhibition he says:—"The last time I got my pictures back the frames were shamefully packed, and in consequence smashed up most disgracefully. One picture had a nail driven through from back to front, right through backboard, picture, gilt matt, &c., and on comparing notes with a friend his pictures also were similarly treated. We determined to protest, but did not. It is too bad, you know, having one's goods knocked about, especially as I had packed them carefully in wadding, and they could not move about, and I know they were all right in London; but there was no wadding and little of anything else when they arrived home. Pardon my grumbling, but I think you ought to know, so that you might give an article in the News before photographers trust their exhibits to future exhibitions."

* *Bulletin de la Societe Francaise.*

I may also refer here to the services which photography renders to public education, in the way of producing transparencies from which enlargements may be projected on the screen, and thus permits numbers to witness the most delicate details of a subject which they would not otherwise be capable of grasping were they treated with the best description possible.

For some years past, M. A. Girard has utilised such pictures as these for teaching chemistry in his classes at the *Conservatoire des Arts et Metiers*; and the Abbé Moigno also employs them in his popular science lectures. England and Germany are more advanced in this respect than we are, and employ these means to strike the eye and appeal to the memory very largely.

To demonstrate this useful application of photography, every day, during the whole duration of the exhibition in Paris, two skilful operators were employed to give public demonstrations. The clichés employed were from the collections of M. Levy et Cie, and MM. Lachenal et Favre, the daily projections including picturesque views, micrographic specimens, and artistic and industrial reproductions. A more extensive adoption of this affair would, no doubt, be a great step towards the solution of the problem of the instruction of children, which is to amuse as well as to teach.

In connection with war, to which photography may be thought by many to have little affinity, we find the art has received many useful applications. We find, indeed, photography much more favoured by the Minister of War than by the Minister of Education, for connected with the former are several studios. One is to be found in the Topographical Department of the War Office, another at the *Depot des Fortifications*, and a third at the *Depot Centrale d'Artillerie*. The last is the most modest of all, but it nevertheless renders very important services. The laboratory is, in fact, the centre whence radiate a number of schools, such as those at Calais, Bourges, Rennes, &c., the *personnel* of which, once sufficiently instructed by those at the central school, are able to comply with demands made upon them.

The applications of photography to the services of the War Department may be divided into two sections: those in time of peace; those in time of war.

In time of peace the work to be performed is confined pretty well to directing and teaching. Photography is used to reproduce the models of all implements of warfare, to register the effects of all new arms, and to record the progress of all works connected with the Ordnance Department. It is made to reproduce in fatty ink, and upon any devised scale, the drawings of artillery *materiel*, whether for manufacture or simply for publication. These duties are daily undertaken by M. Roque, who directs and executes the photographic work of the *Depot Centrale de l'Artillerie.*

The studio in the Topographical Department utilizes photography for producing plans and in the elaboration of maps, and M. Javarez, captain of Engineers, has shown at the Exhibition the details by which he is enabled to make use of a series of plans and work out a map after the method of Colonel Laussedat; he even showed the apparatus of Colonel Laussedat, which has been modified and simplified by himself.

In the same way M. Prudent, also a captain in the Engineers, showed the result of processes which he practises to execute a chronographic map of France on a seal of $\frac{1}{500000}$ from the topographical map prepared by the staff at $\frac{1}{80000}$.

It is a pity that we have no means of knowing precisely what other countries are doing in this direction. The Ministries of War connected with Austria, Russia and Italy will make considerable use of photography, but they did not favour us with a single specimen of their work. Capt. Abney, the learned professor at the School of Military Engineers at Chatham, alone responded to our call, but in his case even, it was only some remarkable views of Egypt, and the Forest at Windsor, that were contributed—pictures which were perfect from a photographic point of view, but which had nothing in common with other photographs exhibited in this section of the exhibition, which professed to show the application of the art to all branches of the public service.

(To be continued.)

FRENCH CORRESPONDENCE.

The International Exhibition of 1878—Preparations by the French Photographers—A Developer for Rapid Portraits—How to Treat a Sitter with Blue Eyes—Chevalier and the Photographic Planetable—Photography and War.

A very important question is just now engrossing the minds of photographers here. You well know the activity with which the administration is endowed at the present moment in organising the preliminaries connected with the Universal Exhibition to be held in Paris in 1878; and if the time of opening this grand gathering is retarded in any way, the fault will certainly not lie at the doors of the commission. Already all the jurors of admission are constituted, and that having to do with photography (Class XII.) is composed of MM. Berthaud, President of Chamber Syndicale of Photographers; Darlot, optician, Vice-President, and Franck de Villecholle, member of the same body; Davaune; the Comte d'Héliand, amateur; Poulenc, manufacturing chemist, and Adolphe Martin, professor of physics. But now it is a question of forming a committee of delegates to represent the exhibitors, and to apportion out the gallery to be devoted to photographic productions, to arrange the exhibits, and to perform the hundred and one other duties that will devolve upon it. Very important and delicate questions have to be decided by this body, for there are interests of all sorts at stake. In 1867 two committees were charged with the duties, the one elected by photographers at large, and representing the great majority of exhibitors, the other composed of members of the Photographic Society of France. This time there will be but one single commission, the members of which to the number of seven will be nominated by ballot; but of the seven delegates, four must be chosen from the admission committee, of which we have just spoken. Three members, therefore, will have to be shortly chosen by the French exhibitors, and this election, as may be supposed, is occupying a great deal of attention among those who are preparing to take part in the great international exhibition of 1878.

It may be remembered that the right to reproduce the objects exhibited in the Exhibition of 1867 was monopolised in return for a considerable payment by one sole photographer to the exclusion of his brethren. This time, notwithstanding numerous offers which have been made, a different regulation is to be made, and everybody is to be allowed the privilege of photographing the interior if they conform to certain regulations. I need not tell you how satisfactory this liberal and equitable decision has been to all.

Now that the wintry weather is rapidly approaching, and daylight is growing day by day more limited, I think the readers of the Photographic News will be pleased to hear of a process which has recently been communicated to me, and which permits one to obtain in an ordinary studio portraits excellent in every way, and yet with an exposure considerably less than usual. In support of my statement I may mention that I have seen specimens of children's portraits in attitudes and with expressions which at once stamp the process as being a very rapid one. The developer employed in the process is made up of the undermentioned ingredients:—

Sulphate of iron	40 grammes
Sulphate of magnesia	40 "
Formic acid	5 "
Alcohol	30 cub. cents.
Acetic acid	10 "
Water	500 "

The salts of iron and magnesia are dissolved in warm water, or rather in the acetic acid diluted with three hundred cub. cents. of water. The mixture is shaken until the whole has dissolved, having a syrupy aspect. Afterwards the rest of the water (two hundred cub. cents.) is added, and the other materials. However short the exposure of the plate has been in the camera, the image will appear in all its detail as soon as this developer is poured over the film, only the negative will be found to be feeble, and requires subsequent intensifying. The author of this process, who desires to remain anonymous, has commissioned me to make it known especially to the readers of the Photographic News, of whom he has been one for many years, notwithstanding the fact of his living on the Continent.

I need not remind my readers that it is now a long time since M. H. Claudet called attention to the accelerating action of formic acid. M. Ferrier, the celebrated stereoscopist, owes to the employment of this same acid the possibility of obtaining those wonderful instantaneous views which all the world has admired.

The same correspondent has made me acquainted with a means which he employes to remedy the defect in portraits of people who possess clear blue eyes. When a sitter possessing eyes of this character presents himself, he takes care to place before the former a yellow screen upon which he is asked to fix his glance during the period of exposure. In this way the eyes are made to appear upon the negative with all the desired intensity, and there is no need to fear that the portrait may be taken for the likeness of a blind man.

Since my last letter to you there has appeared in the Photographic News an interesting article which I read with very great pleasure. I speak of the communication respecting photography as an aid to siege operations, and in which mention is made of the *Planchette Photographique* of M. Auguste Chevalier. He was an intimate acquaintance of mine, and I believe I was one of the first, as I was certainly one of the most ardent, of those who proclaimed the advantages of his system. If Auguste Chevalier had been (as the author of the article believed) a skilful optician, and well informed upon the subject of photographic apparatus, we should have owed him more than one important improvement, and the *Planchette Photographique* would have been adopted long ago. But he was not one of the Chevalier family of opticians. He was a retired navy surgeon, who had resigned before his proper time, and who had for a long time taken an active interest in the applied sciences. I have often assisted him in his combats against indifference and red tapism of Public Offices, and I have been testimony of his clever working by witnessing him operate in company with M. Bisson. It must not be thought that in dying he has carried his secret away with him. The *planchette photographique* has been described in all its details, as also the series of operations necessary not only to produce pictures destined for topographical plans, but also those which are in themselves finished results. All this has been published, and in the Paris War Office there is to be found, carefully put away in pigeon-holes, no doubt, more precise information still on the subject, furnished by the inventor himself.

It is evident that during the siege of Paris some application might have been made of the precious information which Government possessed on the subject of this photographic method. But those at the War Office only regarded suggestions of the kind as puerile. He who writes these lines, and who, by reason of his official duties, had access to those who presided over the defence of the city, made it his business to call the attention of the War Office to the resources attendant upon the employment of the new art, if it were only to reproduce day by day the outposts of the evening. It was only after considerable trouble that he received the necessary authority to go, at every risk and peril, to take photographs, which, as soon as the generals saw, they regretted were not more numerous and more complete. Unfortunately it was then too late. Nevertheless, thanks to the happy improvements which have been made in the *planchette photographique* since the day of our disasters, there is every reason to believe that further experiments will be made with that ingenious instrument under the auspices of the French War Office. Ernest Lacan.

◆

Correspondence.

PHOTOGRAPHY UNDERGROUND.

Sir,—The paragraph in the News of Friday last, copied from the *Birmingham Post*, referring to the subject of photographing in a mine, contains one or two errors, which I shall be glad, if you will allow me, to correct. I believe the first attempt to obtain a photograph underground by means of artificial light was made by myself about the year 1863, when, assisted by Mr. William Mather and the late Mr. J. Pownall, I photographed a part of the Blue John Mine—the Cupola Cavern—in Derbyshire by means of the magnesium light; and a copy of this photograph was exhibited at the meeting of the British Association in Birmingham in the year 1865. This photograph is now in my possession, and can be seen by anyone interested in the matter. The suggestion about sending a powerful light into dangerous places is one that would require much consideration before its adoption. The power of light diminishes very rapidly with the distance, and neither magnesium nor any other light requiring oxygen for its support could be used for photography in a "dangerous" place. There is really now no novelty in the use of the magnesium light for photographing in dark places. Perhaps the most useful thing ever done in this way was the interesting series of photographs obtained by Professor Piazzi Smyth at the Great Pyramid.—Yours, &c., A. Brothers.

Manchester, November 20th.

[Readers of photographic literature are, of course, familiar with the early and interesting experiments of Mr. Brothers with artificial lights. It is to be remarked that, in the extract from the *Birmingham Post*, it is the reporter who is not familiar with earlier experiments. The only claim made by Mr. Brown, as we understand the case, is the successful management of a difficult operation without detailed precedents to guide him.—Ed.]

PHOTOGRAPHY AT THE ROYAL CORNWALL POLYTECHNIC SOCIETY.

Dear Sir,—It is very gratifying to read the encouraging remarks made by the judges as they appear in the "Official Report" published under the above heading in the News of

November 17th, and it shows how thoroughly photographers' aims at improvement are appreciated.

Before the Official Report, an article bearing upon the awards was published a few weeks ago, which, if the writer of this letter is not mistaken, gave a list of successful competitors whose names do not appear in this week's Report, and it would be satisfactory to know which of the two documents is to be considered valid?

At page 435, September 15th, the Judges' Report by Thomas Hart is a document totally at variance with that published November 17th, and it would be satisfactory to the writer, and, probably, also to other members of the profession, if some satisfactory explanation could be forthcoming. It will be gratifying to know that the first report was not a somewhat premature disclosure of that which, in its official form, totally contradicts the first statement. Will you be good enough to enlighten

November 20th. One Who Wants to Know?

[The Annual Report of the Royal Cornwall Photographic Society, like the annual reports of many other societies—the British Association, for instance—is, for some unexplained reason, always issued very late. The extract from the Forty-third Annual Report, which we published last week, was for the year 1875, which had just been received from the Society. The awards published on September 15th last were correct for the present year.—Ed.]

THE COFFEE PROCESS.

Sir,—If your correspondent "G. A. H" will substitute the word *drachm* for *gramme* throughout "J. H. W's" lucid description of the coffee process, he will find no difficulty in determining the proper proportions of each ingredient. Thus, taking one-half the amount of preservative mentioned by "J. H. W." he may use

Coffee	5 drachms
Sugar	2 ,,
Water	6¼ ounces

and taking one-fourth as a conveniently small quantity of developing solution, he may use the following, viz.—

No. 1.—Alcohol...	15 drachms
Pyro	2 ,,
No. 2.—Water	15 drachms
Amm. carb.	2 ,,
No. 3.—Distilled water...	6¼ ounces
Pyro	15 grains
Citric acid	22½ ,,
No. 4.—Distilled water	3⅛ ounces
Silver	45 grains

The method of using the above is clearly given on page 355 of the News.

I should like to take this opportunity to thank "J. H. W.' for his letter on page 479 of the News, and to say that I have found much benefit from allowing the plates to dry spontaneously in a box covered as therein described.—I am, sir, your obedient servant, F. M. Y.

Ryde, November 21st.

Proceedings of Societies.

Manchester Photographic Society.

The ordinary monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 9th inst.,—Mr. Alfred Brothers, F.R.A.S., President, in the chair.

The minutes of the previous meeting were read and passed.

The President then said:—On taking the chair this evening as your President, my first duty is to thank you for the honourable position you have placed me in. It is no part of my business to inquire why you have elected me. I accept the office, and shall endeavour to fulfil its duties to the best of my ability, believing it to be the duty of every member to work for the interest of the Society. I cannot, however, overlook the fact that some of our members—gentlemen who have worked at photography from the time of its discovery, and who have been members since the formation of the Society, twenty-one years since—are equally, if not more, eligible than myself. If the office of President is one to be held for an indefinite number of years, I cannot help saying that in Mr. Mabloy we had a President who was entitled to our confidence and respect, and I can only conclude, from his not having been re-elected, that the majority of the members are of opinion that the office should be subject to change. The others members of the Council render themselves ineligible for re-election for non-attendance, and I see no reason why the President should be an exception. I have, therefore, to suggest that our rule for the election of President should be modified. I think that no member should hold that office for more than two years consecutively, and that he should be out of office at least one year before he is again eligible. By this means other members of the Council would be compelled to take their turn in office. When I say that the President should not hold office for more than two years consecutively, I do not mean that his election should be for two years. I see no reason why the change should not be made annually, if thought desirable. I do not wish to touch on any subject likely to lead to controversy; but there is a matter in which this Society is deeply interested which, I feel, must be alluded to. The interest of these meetings will be seriously interfered with if the members cannot feel safe in exhibiting new apparatus, or in bringing up new matter for discussion. I allude, of course, to the patent recently taken out by Mr. Young. There can be no doubt that the entire apparatus is a copy of one used by Mr. Noton in these rooms on many occasions, and that the parts claimed as new are of very little importance when compared with the whole. It will, I am sure, be admitted that when anything new is shown here it is as much the private property of the exhibitor as if he had kept the object in his own secret possession. If, however, it be the wish of the exhibitor that his object should be described publicly in the photographic journals, such publication should be considered as prohibiting the right of any other person to patent any part of the work. Unless there can be some guarantee that the rule of our Society shall be something like what I have suggested, there can be no doubt that the interest of our meetings will decline. It must be considered satisfactory when our meetings have an average attendance of twenty-eight members. Our Society is entirely technical, and the meetings can only be made interesting by each member feeling that it is his duty to bring everything new or interesting here for exhibition or discussion. But it does not follow that only new matter must be brought forward. An interesting discussion may often be introduced on an old subject. It may have been worn almost threadbare, but a new turn may be given and some valuable information elicited; but we should not lose sight of the point that the members must have confidence in each other, and no cause for ill-feeling must arise as in the case I have alluded to. "What is there new in photography?" This is a question frequently asked, and is one very difficult to reply to. There is much that is new; but is novelty always desirable? The photographic journals teem with new notions and processes; but how many of them are of any value, or come into general use? A careful inquiry into this matter would lead to useful results, but would require more time than I can spare at present. There is one process we are all interested in, which is of universal importance; the oldest, and the one to which the universality of the art is due—the art of printing on paper. There is now a rivalry between this art and the newer one of printing in carbon. Prints by the latter process may be considered permanent, and some may be found who will contend that results equally beautiful with the silver print may be produced in carbon; but, unless they are enamelled, I doubt whether any carbon will compare favourably with a perfect silver print. The perfection of photography may be seen in a silver print, and great permanence may be secured provided the proper care be taken in its production. There can now be no doubt that the permanence of silver prints depends very much on their being properly toned with gold, and afterwards, of course, sufficiently washed. It has been the practice for some years to send out prints of a warm tone, and there can be no doubt that this is often more agreeable than the colder purple. But what is the result? It must have been observed, when looking through prints that have been done a few months, that the once beautiful, warm-toned print has become a sickly yellow, while the fully-toned print retains its original colour, and will probably be found to be permanent if carefully protected. And this reminds me to say that too much is often expected from photographs. Why should not a photograph be as well cared for as a water-colouring drawing? Let any drawing of this class be treated as photographs frequently are, and it will be found that the photograph will in many cases bear the rougher usage. The fact is that photographs are cheap, and are too often valued accordingly. One thing appears to be assured: photography is appreciated by the public. Its applications are innumerable, and are daily becoming more and more valuable. For portraiture, next to silver printing, there is no process giving such wonderful results as the Woodburytype; but the prints have the disadvantage that they require mounting. Next in order stands the photo-tint, which for book illustration (portraits) appears at present to be unrivalled. For general work the various autotype processes are extremely valuable. Photo-lithography must not be forgotten, as by its aid, perhaps, more book illustrations are produced than by any other method. There are other important improvements which might be referred to, such as the production of blocks for printing with type. The few examples on the table will show that great strides are being made in all mechanical printing processes. Can it be said with truth that retouching (as it is called) has been a benefit to photography? So far as it has enabled photographers to produce pretty pictures I grant it has been a benefit; but that photography, as an art, has been benefited I question. The removal of defects is perfectly legitimate—anything beyond that is not so. It is possible to make a man of sixty look only forty-five; it is possible, also, to make a bad negative produce tolerable prints; but does not this lead to a slovenly system of work? It is unsafe to prophesy; but I cannot help thinking that a few years hence it will be found that the over-wrought work of the present day has had its disadvantages. Questions of identity will arise, and show the pernicious system of overworked negatives—the retouching and modifying now so universally adopted will be found to have been a mistake. We are working in the wrong direction; our aim should be to make the negative perfect as it leaves our hands, and to make ourselves independent of the retoucher. I do not suppose for a moment that what I say will have any influence; but I have already seen the disadvantage of the system when enlargements have to be made from small prints from retouched negatives. Artists find great difficulty in restoring likeness in such cases. Truth is sacrificed to prettiness, which, I think, is much to be regretted. The collodio-albumen process has in the hands of so many of our members produced results so near perfection that it may be a waste of time to suggest the trial of any other processes. We have heard a great deal about emulsions and pellicles, but we have seen here very few results from the use of either. May I suggest that if any members have anything to show by the methods named we should be glad to know their experience. It would be tedious to refer to a variety of other matters which suggest themselves for notice; they will probably crop up during the session, and I shall not fail to the extent of my ability to call your attention to anything of importance.

The Secretary then read a paper by the Rev. Canon Beechey, M.A., Vice-President, entitled "Beechey Plates and Their Working" (see page 554), which was followed by a short discussion.

The President showed some choice specimens of photo-mechanical printing, which were much admired.

Mr. Coote showed a negative, and a transparency from it, in which some distant hills were distinctly visible through the two masts of a vessel in the foreground, but not through any other part. This peculiarity was not satisfactorily explained.

Mr. D. Young exhibited his oxygen apparatus, to convince anyone interested that it was really an improvement on Mr. Noton's.

The President admitted that the apparatus shown by Mr. Young was an improvement upon the one shown by that gentleman at a former meeting, and also upon the original machine designed and made by Mr. Noton.

A vote of thanks was passed to the Rev. Canon Beechey, M.A., Vice-President, for his timely and interesting communication.

Talk in the Studio.

New Discovery in Photo-lithography.—A correspondent has invited our attention to a discovery he has made, by which the production of a surface for printing with fatty ink in a lithographic press becomes one of the simplest processes in photography, being effected direct in the camera, in manner similar to the production of a negative. We hope shortly to place details before our readers.

Tobacco Preservative.—We have been favoured by our esteemed contributor Mr. W. H. Watson with some prints from negatives produced by the tobacco process described in our last Year-Book. Some of the prints are from negatives by Mr. C. F. Bird, and others by Mr. Watson himself. They are all excellent, and justify the remark of Mr. Bird, who observes, "I still keep in full faith and practice with the tobacco process."

On a New Reaction of the Iodates and Iodides.—M. Corne, in the *Journal de Chimie*, states that if to a solution of an iodate he added a solution of starch and a few drops of water in which phosphorus has been kept, an intense blue colour will appear, which the author thinks is due to the action of phosphorous acid; the iodides will not cause this reaction. In testing for iodine, if an excess of hypochlorite is added, the blue colour does not in some cases appear. This error may be avoided by boiling with a few drops of hypochlorite of soda, to transform the iodide into iodate, which, with phosphorus, water, and starch, will give readily the blue coloration.

Ancient Toughened Glass.—In a "Book of Curiosities" we read:—"There was an artificer in Rome who made vessels of glass of so tenacious a temper that they were as little liable to be broken as those that are made of gold and silver. When, therefore, he had made a vial of the purer sort, and such as he thought a present worthy of Cæsar alone, he was admitted into the presence of their then Emperor Tiberius. The gift was praised, the skilful hand of the artist applauded, and the donation of the giver accepted. The artist, that he might enhance the wonder of the spectators, and promote himself yet further in the favour of the Emperor, desired the vial out of Cæsar's hand, and threw it with such force against the floor, that the most solid metal would have received some damage or bruise thereby. Cæsar was not only amazed, but affrighted with the act; but the artist, taking up the vial (which was not broken, but only bruised together, as if the substance of the glass had put on the temperature of brass), drew out an instrument from his bosom and beat it out to its former figure. This done, he imagined that he had conquered the world, as believing that he had merited an acquaintance with Cæsar, and raised the admiration of all beholders; but it fell out otherwise, for the Emperor inquired if any other person beside himself was privy to the like tempering of glass. When he had told him 'No,' he commanded his attendants to strike off his head, saying, that, 'should this artifice come once to be known, gold and silver would be of as little value as the dirt in the street.' Long after this—viz., in 1610—we read that, among other rare presents then sent from the Sophy of Persia to the King of Spain, were six mirrors of malleable glass, so exquisitely tempered that they could not be broken."

To Correspondents.

J. F. Newland.—We should say that the proportions and plan generally, are very good. The side light might have been continued a foot more towards the floor with advantage. Tracing returned by post.

Noodle.—The precise proportion of any salt required to make a saturated solution varies slightly with many conditions, the temperature being one of the most important. Assuming the purity of the salt and the water, protosulphate of iron would require 166 ounces of water at 62° Fah. to dissolve 100 ounces of the iron salt. About 1⅔ ounces of water may be thus reckoned for an ounce of the iron salt. Hyposulphite of soda is very soluble, little more than three-fourths of its weight of water at the above temperature being necessary for a saturated solution.

W. C. G.—The report in question is the Annual Report for 1875, which is just issued.

H. B. W.—Judging from the examples enclosed, and the details you furnish, we have little doubt that the cause of your trouble is the use of an excessively acid toning bath, and immersing the prints in the hyposulphite bath whilst saturated with acid solution, which decomposes the hypo, and produces the stains and yellowness. The chloride of platinum as sold commercially contains invariably excess of acid, and this besides bleaching the print, saturates the paper and causes decomposition in the hypo bath. We have used a toning bath with success made by thoroughly neutralizing the platinum solution by carbonate of soda, then adding a minute trace of nitric acid to secure a faint acid reaction. This bath toned well, and the prints being rinsed before immersion in the fixing bath, no trouble was experienced. It is quite possible, however, to get good black tones with a gold bath. We believe those published prints to which you refer are produced by Willis's Patent Platinum Process, to which we have recently, more than once, referred. For such subjects the carbon process by simple transfer would give the best results with the least trouble.

S. B. Matthews.—The silver from your mixed residues may be recovered as a sulphide by adding liver of sulphur, as we have often described; or the silver may be thrown as a metallic powder, by immersing in the solution clean pieces of zinc or copper. 2. With some samples of paper the colour acquired in the toning bath is very much reduced in the fixing bath. In that case, you must tone more deeply. But it frequently happens that the loss of colour is really due to the use of a weak negative, which does not permit of sufficiently deep printing to secure a rich black tone in the finished print. A print from a weak negative will frequently look very well in the toning bath, but grows brown and faint in the hypo, simply because there is insufficient silver reduced by the light printing. As a rule, where a bad smell is given off by the hypo solution, it is an indication of decomposition, and suggests that the prints have not been washed after toning before immersion in the hypo bath, some traces of acid still remaining, sufficient to decompose the hypo and cause liberation of sulphurous fumes. Whenever the smell of cabbage water is given off by a fixing bath, the permanency of the prints cannot be hoped for.

A. G. D.—We have not seen Mr. Slingsby's new studio, but we have heard very good accounts of it as to rapidity, simplicity, and ease in managing the light, and good results. Apart from an improvement of this kind, we should build an oblong ridge roof of about the proportions yon name; the width, perhaps, a little less. We should prefer it to stand east and west, so as to secure a north side-light. About six or seven feet at each end of sides and roof we should make opaque; each end opaque, of course, and about twenty inches from the ground of both sides also opaque. These are general proportions. Many details would be regulated by circumstances. If we were about to build a studio, we should go and see Mr. Slingsby's.

Coquetdale.—The solution of the negative film whilst varnishing is due to one of two or three causes, or a combination of them. The most frequent cause is the condition of the collodion, which, either from the original quality of the pyroxyline, or from its age, has become somewhat rotten, giving a powdery film, which is easily soluble in alcohol alone without the aid of ether, especially when warm. If the varnish chance to have been made with very strong alcohol, it readily dissolves such a film, and more readily if the plate be made very hot. Some samples of varnish are made with a mixture of wood napthha and alcohol, and this mixture has a solvent action on the collodion film. Sometimes a few drops of water added to the varnish will reduce the strength sufficiently to prevent this. After adding the water and shaking, the varnish will look turbid; but after some hours the brightness will return. Sometimes the application of the varnish to the negative quite cold will prevent solution. In that case the plate must be held before the fire when the varnish is setting, and before it chills, and this will cause the plate to dry bright. The best safeguard, when the danger is imminent, is to give the plate a wash with dilute gum or albumen—the latter by preference—and allow it to dry before varnishing.

F. Worsley Benison.—There was, some years ago, a journal with such a name, which was most ably conducted; but we have not heard of it for the last half-a-dozen years, and we thought it had ceased to exist. It appears to have drifted into unscrupulous hands. The patronage referred to probably did attach to the paper in its respectable days. As the editor gives the address of the publishing office to which he invited you to send, it is to be presumed that the paper still exists in some form, and any warning on the subject might be held to be libellous. Your telegram received since the above remarks were in type.

One in a Fix.—If a print be coloured in water colours, the colours must be fixed or protected in some way before enamelling, or, of course, the colours will run or be removed. A coating of collodion applied to the coloured print will, probably, protect the colours, so as to avoid risk if the subsequent operation of enamelling be done with care.

A Constant Reader.—To prepare drawing paper for printing it is sized with a solution containing five grains of chloride of ammonium, or five grains of common salt and one grain of gelatine in an ounce of water. The solution should be warm, and may be applied either by a Blanchard brush or by floating.

W. J. Earley.—The acetate toning bath, the formula of which you mention in your letter, is an exceedingly good one, and is used very largely. It will give admirable tones. The fault in the print you enclose is not in the toning bath, nor in the paper, but in the negative, which is considerably under-exposed, and lacks gradation and vigour. In order to secure a good tone the picture required printing much deeper, and if this had been done all the detail would have been lost. A good negative with proper gradation, and sufficient vigour to permit of deep printing, is required to produce a fine print which will take a fine tone in the gold bath. 2. There are various modes of obtaining natural clouds in pictures. With a good light, quick process, and fine suitable cloudy sky, natural clouds are often obtained in the negative. Sometimes they are obtained by covering the portion of the plate containing the sky after a moment's exposure, giving the foreground longer. Sometimes they are printed from a separate negative. You will find articles on the subject in our back volumes and in our back Year-Books 3. Tinted albumenized papers are used for both portraits and landscapes. It is purely a matter of taste. 4. Photographic soap is efficient in removing stains; but it generally contains cyanide, the dangerous element which photographers wish to avoid. 5. Captain Abney's is an excellent instruction book. Mr. Hughes' is another. And that of Mr. Heighway another.

W. Brooks (Bedford)—The letter has been addressed and posted.

Several Correspondents in our next.

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METEOROLOGICAL REPORT FOR OCTOBER.

BY WILLIAM HENRY WATSON, F.C.S., F.M.S.

Observations taken at Braystones, near Whitehaven,
36 *feet above sea-level.*

N.B.—Barometric pressure not reduced to sea-level. Temperature in the shade.

Date.	Barometric Pressure.			Temperature.			Remarks.
	Morning	Noon.	Night.	Morning	Noon.	Night.	
1	29·68	29·85	30·02	48°	57°	42°	Fair and clear
2	29·98	29·98	29·80	51	57	51	A little rain p.m. Windy
3	29·69	29·65	29·65	54	57	56	Rain a.m. and p.m.
4	29·50	29·50	29·53	59	60	54	Rain a.m.
5	29·62	29·62	29·60	59	62	61	Showers of rain at night. Strong wind
6	29·60	29·59	29·63	64	65	58	Showers p.m.
7	29·61	29·63	29·70	59	64	58	Rain a.m.
8	29·73	29·70	29·50	60	63	56	A little rain a.m. Heavy rain p.m.
9	29·21	29·22	29·19	53	57	55	Rain a.m.
10	29·22	29·23	29·21	51	54	50	Heavy rain with thunder and lightning [p.m.
11	29·20	28·96	28·79	51	58	54	Heavy rain. Very stormy all day. [Thunder and lightning at night
12	29·41	29·48	29·43	50	53	51	Fair, bright, and clear
13	29·18	29·18	29·19	49	54	54	Rain a.m. and p.m.
14	29·23	29·35	29·50	54	55	54	Rain this morning
15	29·55	29·57	29·56	55	57	53	Fair and clear
16	29·40	29·37	29·30	53	52	54	Rain a.m. and p.m. with strong wind
17	29·47	29·47	29·47	57	60	60	Rain a.m. and p.m.
18	29·47	29·50	29·50	59	62	57	Rain a.m. and p.m.
19	29·60	29·68	29·80	60	63	53	A little rain a.m. and p.m.
20	29·87	30·00	30·00	58	62	53	Fair all day. Gloomy
21	30·03	30·09	30·10	49	54	38	Fair, but gloomy
22	30·10	30·08	30·10	38	54	38	Fair and clear
23	30·06	30·10	30·08	45	52	46	A little rain a.m.
24	30·08	29·98	30·02	46	50	46	Fair, but gloomy
25	30·10	30·11	30·12	47	53	47	Fair, but gloomy
26	30·10	30·09	30·08	46	51	49	Fair and clear
27	30·09	30·09	30·07	48	52	49	Fair and clear
28	30·03	30·09	30·09	48	50	53	Fair, but gloomy
29	30·04	30·02	30·00	50	53	49	Showers of rain this evening
30	30·00	30·03	30·06	48	48	41	Fair and clear
31	30·10	30·13	30·14	31	40	33	Fair but cloudy

Summary.

	Mornings.	Noons.	Nights.
Highest temperature observed	60°	65°	61°
Lowest ditto	31	40	33
Mean ditto	51·3	55·8	50·7

Mean of all observations ... ... 52°·6

Number of fair days 13
Number of days on which rain fell 18
Number of fair days clear 7
Number of fair days gloomy 6

Note.—It will be observed that the barometric pressure was very uniform during the month.

Braystones, near Whitehaven, November 7, 1876.

The Photographic News, December 1, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Coloured Light in the Studio—The Rapidity with which Scientific News Travels.

Coloured Light in the Studio.—The advisability of employing coloured light in the studio is a subject that has often been under the consideration of photographers. Our Paris Correspondent the other day mentioned the circumstance of a photographer, M. Scotellari by name, who has recently essayed the employment of violet illumination in his studio with good success. It is said that by only admitting violet light in this way to the studio, the exposures are reduced by one-half, while at the same time the clichés produced are of a more harmonious character; that is to say, the negatives have more detail in the high lights and in the shadows than if ordinary daylight had been employed in their production. In a word, it is said, the pictures are more delicate, and are free from that hardness which usually characterises shortly-exposed clichés. M. Scotellari does not, it seems, employ violet glass for glazing his studio, as this would be a very costly proceeding, while it is doubtful whether he could obtain a large enough supply of material of a uniform tint, but uses a violet varnish, coloured to the proper degree, which he applies to the panes of glass in his atelier. Violet curtains are also fitted to the room, and thus the sitter is enveloped on all sides by a flood of violet light. Not only does M. Scotellari bear witness to the beneficial results obtained under these circumstances, but a chemist, M. Prat, of Bordeaux, confirms the statement. Moreover, M. Scotellari is so sanguine about the plan that he proposes, that he has taken steps to patent the method forthwith, so that none can practise it, at any rate in France, unless they first of all secure leave and license to do so. It is this last step which we cannot quite comprehend. If the practice of employing coloured light has not obtained in France, it has certainly done so in this country, in Germany, and in Switzerland. Over and over again has trial been made to use, if not violet, at any rate blue, rays in the taking of clichés, and it seems strange that M. Scotellari should be ignorant of the circumstance. The Court Photographer of Vienna, M. Angerer, built a very fine and spacious studio, and glazed it throughout with blue glass, which we ourselves have had the pleasure of inspecting; while M. Constant-Delessert but a few years ago published in our columns the results of some experiments he had made with rose-tinted light and rose-coloured screens and curtains, which he averred had a wonderfully softening effect upon portraits taken under their influence. The use of a piece of blue glass has also been resorted to, placed in front of the lens, which is said to answer the same purpose as a reflecting blue light upon the object to be photographed. But all these propositions have died out, or, at any rate, have never come into general use. The portraits and groups of M. Angerer are very soft and beautiful, but not more so than are produced by other photographers who work with white light and under ordinary circumstances. Take two Viennese studios which compete keenly with Angerer's establishment, those of Fritz Luckardt and Adele; neither of these have recourse to coloured light in producing their unrivalled portraits, and yet they are quite aware that one of their brethren in the city has a studio illuminated with blue light. However, it is a matter easily tested, whether you may do away with half the exposure and at the same time get more harmonious pictures, as M. Scotellari tells us is the case in his blue chamber, and we hope that we may be treated with some scientific results on the subject by the patentee. We have no wish to deprecate any trial or investigation that may have the effect of conferring such remarkable advantages as those claimed; but as these have been mentioned in general terms only, we do not think they convey to photographers at large much more information than they already possess on the subject. The violet end of the spectrum, as everybody knows, acts under ordinary circumstances with far more energy than any other rays; but it has got to be proved that, by interposing a screen which excludes all other kinds of light, and which possibly excludes some portion of the blue also, the actinism of the sun's rays is thereby increased. You are not here concentrating the blue rays of light, be it remembered, but simply keeping back other rays, which, if we are to believe Dr. Vogel, Capt. Waterhouse, and others, are, under some conditions, as capable of impressing the sensitive film as violet light itself.

The Rapidity with which Scientific News Travels.—A paragraph has been going "the round of the press" to the effect that M. Janssen, the well-known French astronomer, has invented an instrument for recording automatically the aspect of the sun from time to time, and the name of the invention, it appears, is the *revolver photographique.* The news emanates, too, from a scientific journal devoted to medical matters, so there can be no doubt about the authenticity of the paragraph; and it is this circumstance, probably, more than anything else, that has given the communication weight, and caused it to be copied by London morning papers, as well as those in the provinces. We cannot, therefore, very well deny the fact any longer, but must admit that M. Janssen has really invented an automatic photographic instrument called the *revolver photographique*, for securing successive pictures of the sun, and obtaining in this wise records of any phenomena that may be observable against or upon the solar disc. And having admitted so much, we will not check the anxiety we feel to give information, but at once proceed to acquaint our readers with the fact also, that this winter it will be exactly two years ago since the transit of Venus was observed by many scientific men in different parts of the globe, and that the ingenious instrument of M. Janssen was invented and described even before then. It is positively refreshing to see a naive paragraph like the one we mention. We shall next be informed, doubtless, that M. Janssen has been so fortunate to observe the protuberances of the sun when there is no eclipse, for this also is essentially true, although hardly so novel, perhaps, as the *revolver photographique*; or possibly we may at an early period be informed that there is such a man as Janssen, and who he is. We may hint that the Royal Society of London awarded him a gold medal yesterday for recent researches with the spectroscope.

NOTES ON A TOUR IN SOUTH ITALY.

BY THE REV. W. A. CROFTON ATKINS.*

THE council having done me the honour to request that I should communicate a paper on my photographs of South Italy, which are in this year's Exhibition, I propose to lay before you a few descriptive notes.

Being ordered away from the English winter, I determined to revisit old ground, and, accordingly, arrived in Rome a few days after Christmas, and having some months to spend from home, I as usual took some photographic apparatus as a means of occasional amusement. In these notes I purpose to *gossip* only, and not to weary with archæological details.

Let us walk from the busy streets of new Rome towards the old city—always amusing, always fresh, are the streets of Rome. Even after many visits, one is still interested in the street groups; cross the Piazza di Spagna, and there are the peasants in their picturesque costume *posing* on the steps leading to the Trinita di Monti, with their usual affectation, for they are spoilt by their profession. Every common-place peasant dressed in his native costume thinks himself an Adonis, and is worth so much an hour to his artistic employer. The ugly Roman women, with their large flat noses and thick lips, believe that the passers-by are struck with their beauty.

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* Read before the Photographic Society of Great Britain.

And who shall describe the ecclesiastics of Rome? I remember when I went to Rome for the first time, years ago, that the prevailing impression left upon my mind was that, with the exception of the hotel waiters and the shopkeepers, the whole population was clerical. Turn from the Piazza into any of the streets leading to the great thoroughfare, the Corso, and you soon find yourself in the bustle of Cheapside, pushed about, and off the narrow pavement—for the "Corso" does boast of a trottoir a few feet wide, which is saying a great deal, for with rare exceptions there is no place for pedestrians in all Rome—you must take your chance amongst the carriages of the many Roman princes, and the rough carts from the Campagna, over the stones, often as pleasant walking as over the moraine of a glacier. Pushing our way along, past the magnificent Column of Marcus Aurelius, past palaces and galleries full of art treasures, we get into rather calmer water at the Forum of Trajan, and presently to the Forum Romanum. Passing on (for I take no views of the Forum to-day), I settle myself comfortably in a quiet corner of the Temple of Venus and Rome, and my valet-de-place—who takes intense interest in my extraordinary proceedings—helps me to get ready for work. The *Arch of Titus* is what I want. To me, contemplating this monument over the top of my camera, comes up a party of English. "Dear me! a photographer! How funny!" and they proceed to criticise me and my apparatus in that pleasant, well-bred manner characteristic of some of our countrymen, especially of that class which "*does*" Rome in a week, and boasts that it has been everywhere, from the "lantern" of St. Peter's to the catacombs of St. Sebastian, and seen everything, from the Raphaels in the Vatican to the tenth-rate "Portraits of Gentlemen" in the Doria.

The Arches of Rome are generally very interesting, but that of *Titus* possesses special interest, as it commemorates the taking of Jerusalem. It was erected by the people in honour of Titus, on the summit of that road known to us when we were struggling with the difficulties of Horace.

"Ibam forte Viâ Sacrâ," compared with the other triumphal arches, it is the least ornamented and florid; inside the arch is a bas-relief of a procession carrying away the golden candlestick from the Temple of Jerusalem, and on the front facing the Colosseum is an inscription proving that it was erected after the death of Titus. It was finished in the reign of his brother Domitian, but whether with Domitian's full approval may be doubtful, as the brothers had certainly not lived in brotherly affection, especially if we may credit the story that Domitian ordered his dying brother to be placed in snow to cool his fever! Well, having taken a negative, my attendant gave me his criticism on its qualities, but as he had never seen a negative before, and knew as much about photography as he did of the Emperor Titus, I was not deeply concerned. This man, who always accompanied me, amused me by his free criticism, always desiring to see the negative, when he would often encourage me with a shrug of the shoulders —"Pas mauvais, Monsieur!" but though he did not know much about photography, he thoroughly understood the art of charging for his attendance, as well as the art of getting some one else to carry my boxes. The exterior view of the Colosseum I took the same day, in rough weather, for it so happened that, during this stay in Rome, the weather was not good for photography. The Flavian Amphitheatre (for the name "Colosseum" was utterly unknown until much later times) has been painted, sketched, and photographed, until it is the best known of all the remains of ancient Rome. Its date is nearly that of the Arch of Titus. Vespasian commenced it, his son Titus almost completed it, and dedicated it in the year 80 A.D., and his successor, Domitian, finished it entirely. Its use and object are too well known for me to speak much on the subject. Scarcely any city, even of small size, was without its amphitheatre: gladiatorial exhibitions and wild beast fights were the delight of the people. The amphitheatres became the ordinary place for the martyrdom of those who contended for the Christian faith, and I suppose few, if any, persons go into the Colosseum for the first time whose thoughts are not carried back for the moment to the early martyrs of the Christian Church.

After some little difficulty I obtained an "artist's permission" to photograph the interior, and this view has some little interest, as showing the recent excavations of the Arena. (Here, in a parenthesis, let me advise all who want records of Continental travel to obtain "permissions" before beginning to work. It is a mistake to assume that you are at liberty to photograph even the *outside* of buildings in some towns; and I know nothing more annoying—after some trouble in the preparation of your apparatus, and the selection of your view—than to see the stern, yet civil custode, with the usual Continental Jack-in-office tone, approach with the well-known formula: "Il est defendu.")

The interior of every amphitheatre was divided into the Arena, the Podium, and the Gradus. The arena was the clear open space where the performance took place. The Arena of the Colosseum has lately been excavated to the extent of one-half, showing the dens in which vast numbers of wild beasts were kept; probably also those who were destined to fight as gladiators were shut up here. The gladiators generally were slaves and war-captives, but could be voluntary freed-men. The Arena was separated from the Gradus by a high wall, which of course was a necessity to guard the spectators from the attacks of the animals. The Gradus was the part containing the rows of seats for the audience. There were four principal entrances, one of which is shown in the centre of my view. The Colosseum was capable of holding nearly 100,000 persons; and the arena, it is said, held 5,000 beasts at the dedication by Titus. Naval battles were also occasionally represented, as the arena could be flooded for boats. Many of the Roman palaces, such as the Farnese and the Baberini, have been, to a great extent, built with the material taken from these ruins in the middle ages. It is a custom much in favour to visit the Colosseum by moonlight; and doubtless it is very romantic. At the same time, I know of no better way of practically making acquaintance with the fever, which was more than usually prevalent last winter.

Close to the Colosseum stands another of those triumphal arches which were erected in honour of victorious generals. The *Arch of Constantine* in the Via di S. Gregorio, in my opinion one of the most beautiful of the Roman arches, has three archways, with Corinthian columns on each front. My view is taken looking towards the Colosseum. The bas-reliefs are very fine. Like almost everything else in Rome, this arch has been the subject of much dispute its date being variously given; but there can be but little doubt that it was built in honour of the victory of Constantine over Maxentius, and that it is not of Trajan's time (200 years earlier), though much of the sculpture is certainly of his date.

One more of the Roman arches is shown in my view—the *Arch of Janus Quadrifons*, in the Forum Boarium. This is not a triumphal arch, but was constructed as a kind of exchange, or place of public meeting for business, at the junction of several streets. It is a square block, built in a very solid manner, pierced by four arches, with but little ornamentation. The niches originally contained statues.

We now take the neighbourhood of Naples. I know of no such beautiful coast drive in Europe (not even excepting the cornice) as that from La Cava, or Vietri to Amalfi—three or four hours of the most exquisite, ever-changing scenery, with the mountains on your right, and the blue sea (such a blue as we never see near our coast) on your left far below. The road winds about; every mile brings you to a picturesque village at the mouth of a mountain gorge, till, turning a point, we arrive at the prettiest village of all—*Amalfi*—a mere *village* indeed now, but formerly a place of no small importance. In the twelfth century, Amalfi was a little republic with 50,000 people, and possessing much local power, the Island of Capri being subject to it. Situated full south, the heat is almost tropical—even in January an umbrella was a necessity. Here the vegetation is luxuriant, the olive, myrtle, and orange, and ferns in every variety clothing the sides of the mountains.

A few hours' sail from Amalfi brings us to the Island of *Capri*, classically famous as the residence of the Emperor Tiberius, who, retiring from Rome and leaving the government in the hands of his favourite, Sejanus, gave himself up to the life which has made him so notorious. Capri as a winter residence has many advantages. The air is warm, yet not relaxing; the rocky scenery perfection; the people pleasant and honest—neither of which adjectives can ever be attributed to any other of the southern Italians. People are wont to dwell with enthusiasm on the beauty of the Bay of Naples; but I am of opinion that no one who has not seen the bay from the road to Anacapri, on a clear day, has any real conception of its beauty.

And now, hoping these few notes may interest some one, I will close my paper respecting my winter journey in South Italy.

The Journal of the Society's says the following has been received since the meeting was held :—

NOTE.—At Naples I had the pleasure of making the acquaintance of a distinguished scientific photographer, Mr. Woodbury, who very kindly and courteously endeavoured to make me a convert, but, notwithstanding the perfection of his small pictures by the "emulsion process," and its undoubted convenience, I remain a firm adherent to the old simple wet-plate process. As I work but very occasionally, and should always be compelled to have an attendant, the carriage of the apparatus is a matter of indifference, and the certainty of obtaining a fair result is a great satisfaction. The preparation and development of dry-plates, in my humble opinion, quite equals the fatigue of working the wet process. My apparatus is small and compact; I have had tents from many makers, but my old favourite, Thomas' box tent, admirable as it is for large plates, was out of the question for so much railway travelling. Mr. Meagher, therefore, made me an extremely portable modified form of Captain Abney's tent. I may mention here that nearly all my architectural views were taken with the ordinary symmetrical lens of Ross; nine inches focus for the 8½ by 6½ plate; for architecture it is quite impossible that this lens can be excelled at present; it is as perfect for this purpose as the Dallmeyer "Wide-angle Landscape" is for pure landscape.

As my tent carries everything but the camera, there are only two packages to be taken into the field, with two light tripods strapped to the tent.

The keynote to wet-plate photography is always "simplicity," and from the cleaning of the plate to the washing of the print I keep this as a motto before me. With the utmost deference for the opinion of others I have often thought that unnecessary and complicated additions have been introduced into every part of almost every process. With my motto before me, I would reject, in cleaning the plate, all powders and "plate cleaning solutions," and I think (my readers will bear in mind, always with deference to their views) albumenizing merely lost labour. My practice is to dip new plates for a very short time in some alkaline solution, and to soak whole plates in nitric acid and water after rapidly immersing them in hot water and soda I am aware that this plan is objected to, but I have always found it entirely successful, the surface of the patent plate remaining bright, provided the immersion is but for a minute or two, which is sufficient to remove all the varnished film.

As to collodion—what will Mr. Thomas and Messrs. Mawson and Swan say when I admit that I very often get the best general results from a mixture of the two collodions—will they call it heresy? I do not think too much stress can be put upon the necessity of the quality called ripeness. I never use collodion if I can help it, before it has been iodized at least three or four months.

I object to all additions of organic matter to the developer, as a general rule, preferring a solution of ordinary iron, with the ammonia-sulphate in equal proportion. My experience of this developer leads me to consider it perfect; it keeps almost any time, and by taking a saturated solution into the field, with a small bottle of glacial acetic acid, any strength desirable for the particular subject in hand can be immediately made. Much delicacy is obtained in the negative with this developer, and I am certainly of opinion that the use of the ammonio-sulphate reduces the time of exposure; and, other conditions being right, I have never had a single case of fog, even under trying circumstances. I intensify with pyrogallic acid in preference to iron, and fix with hyposulphite of soda; to me it is far more satisfactory to finish the negative at once, for undoubtedly disasters do frequently happen to negatives washed with golden syrup, or otherwise kept moist for some hours.

CLOUD CLICHES.

BY KARL RITTER VON STEFANOWSKI.*

It very seldom happens in landscape photography that we are enabled to secure good cloud effects at the same time as a well detailed picture. The background of a landscape photograph is usually a monotonous white or grey surface, cold in its nature, which has an injurious or unfavourable effect upon the rest of the picture. The reason of this defect lies partly in the moving character of the clouds, which are driven about by the wind, and therefore take up a fresh form every moment, but is in the main due to the very strong lights, perhaps of a sky free from clouds, which cause the background of the cliché to become over exposed or solarised, before the taking of other details in the landscape has been completed.

Many photographers, including those of the highest order, have sought to overcome the evil, and so to produce landscapes of a picturesque and artistic character. Some of these secure their clouds by double exposures (by long and short exposure with the camera in the same position) and also by double printing. M. Fages, who has prepared cloud plates upon glass, requires a good deal of time in undertaking the printing thereof. The glass plates are employed in such a manner that the landscape is first of all masked with black paper, so that the print remains perfectly white in the protected parts, and this portion of the paper is then subsequently printed under a cloud negative.

Fages' idea is, no doubt, very pretty and ingenious, but has the practical inconvenience attached, that the printer must proceed with unusual care not to let the separation lines be seen, and this is very difficult to do when there are plants, shrubs, rocks, buildings, &c., the outlines of which have to be followed. Another plan of printing-in clouds, which is followed by many photographers who care very little for art in their work, is as simple as it is unsatisfactory. They simply put between the glass of the copying frame and the negative a few tufts of cotton wool, and in this way manage to produce white patches, if not white clouds, upon their photographs.

With the aid of the carbon process or pigment printing, however, the photographer is in a position to produce most natural cloud effects upon his landscape picture, as may be seen from the specimens I have laid upon the table for the inspection of members of the Society.

The clouds may, with a little patience and under favourable conditions, be produced in the most charming manner, and beautifully massed. Positive images are produced in the ordinary way from the negatives to serve for the production of the cloud plates. One of the main objects to be obtained in securing clouds upon landscapes is, that the tone of the picture from above to below should become darker and more intense, the lowest portion of the cloud against the landscape being dark, so as not to interfere in any way with the outline of the landscape that is next to it. The other principal object fulfilled in these cloud plates is, that only the most beautiful cloud-masses are secured and transferred upon the gelatine film.

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* Read before the Vienna Photographic Society.

The gelatine film upon which the clouds are transferred is especially delicate; it is supple, free from brittleness, blends easily with the photograph, and may be printed from both sides, according as the lighting requires the clouds to be printed from one aspect or the other. So that my colleagues may understand the manipulations better, I will recapitulate the various points in the process.

1. If the landscape negative is not well covered, or opaque in the sky, this part must be treated with pigment, to remove all irregularities that exist; this is done on the varnished side, zinnabar or gamboge being applied by the aid of a brush.

2. The landscape is then printed in the ordinary way from this negative, until all the details are out. The cloud film or cliché is then placed upon this newly-printed picture, so that the dark part of it covers the already printed landscape, the clouds being so disposed as to harmonise with the lighting of the picture.

3. When this is done, the picture is again put into the printing-frame, and exposed once more to the action of diffused light. The greatest care is here necessary, and, as a precaution, it is well to put over the frame a sheet of black paper to the height of half or one centimetre above the horizon of the picture. Nevertheless, it is not at all necessary to follow any promiscuous outline of the landscape, for even in the case of trees, houses, and other high points which rise above the horizon, they are already sufficiently dark that the clouds do not interfere in any way, and the picture retains its truthful aspect.

4. When clouds are lightly depicted upon the picture the work is done, and all else depends upon general principles. The time of exposure is regulated according to circumstances; the depth of printing the clouds must depend upon taste and judgment.

In conclusion, I may remark, that I lately saw a cloud plate at the firm of Krzwanek, of Vienna, which had also been prepared by the aid of the carbon process; it was a commercial article, and was the production of M. Carette, of Paris, being marked "A. N. O., Paris." This had the defect to which I have already called attention; it possessed no artistic value, and was not true to nature, having been produced by the aid of cotton wool, as I previously remarked. All variation in tone failed, and for this reason it would have been difficult to print into a negative.

Cloud clichés such as I have described are also, I may mention, to be purchased in Vienna of the trade.

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ON STEREOSCOPIC BOTANICAL SUBJECTS.

BY F. H. WORSLEY BENISON.*

Botanical stereographs are, I think, one of the simplest of the many branches of our art that any one could deal with, both as to the subject and the size of the picture. We have small pictures and no sky (absence of sky in a photograph covers a multitude of faults).

It is a fact to be regretted that any one setting himself the task of reviving an appreciation of stereographic photography by the public mind has his full share of work cut out, pleasant though it may be.

That this particular style of picture is almost forgotten is not surprising, when we look back on what used to be the wretched state of affairs, namely, in a word, "trash," supposed to be viewed through a stereoscope to match. Because a man declined to have his eyes screwed an inch out of their proper place, one of the most charming and entertaining branches of photography (if properly carried out) has been allowed to lapse into the catalogue of forgotten things.

Please note the adjectives I have used, *charming* and *entertaining*, as they are, I think, especially applicable to the kind of picture I am speaking about.

That a different state of things is possible is happily proved by the excellent instruments which are now obtainable, as shown in the new stereoscopes and the graphoscope, nor are the subjects behind the instruments in quality; but still the old abominations seem to hang as a curtain between the would-be purchaser and this excellence; and referring to my previous remark, it will only be time and perseverance—in the right direction—that will do away with this obstruction.

If I may be allowed, I should like to say a word here of warning or advice to photographers, on the way of mounting the two pictures. I have now in my possession a stereograph where there is a good quarter of an inch of subject in the one picture that is wanting in the other; in other words, the two do not coincide; the consequence is, pain to the eyes, and a long stare, before the pictures blend and show up the relief. To avoid this, all details in the one should correspond with those in the other; a house or tree in the centre of one should be in the same position in the other. The carrying out of this rule with carefully chosen and interesting subjects will, I think, complete the duties of the profession to the public.

Referring to the instruments again, I should like to suggest that it would be a great advantage, in addition to the rack-and-pinion regulating the distance between the eye and the object, to make the distance between the lenses subject to the same movement, as all persons' eyes are not exactly the same width apart. We find this fact provided for in all good binocular field glasses.

Botany affords a peculiarly interesting field for the camera, as in this branch of science we can obtain an infinite variety of tit-bits, and it is these very tit-bits, I think, that our art can do most justice to. None of nature's endless variety of charms, the far-reaching landscape included, are more fascinating than the common road-side hedge bank (or, to convey the picture more forcibly, I should say *lane*-side) with the sunlight playing upon it, causing the exquisite light and shadow over the whole so necessary to make the *picture*.

The formula by which I have worked, and still continue to work, may be interesting to some, if only from its simplicity. The bath I make of 35 grains of silver to the ounce of water (distilled or filtered rain-water boiled), with an addition of 4 grains of iodide of potassium to every 16 ounces of solution, or in place of the potassium I add a little old collodion. My developer is composed of iron 2 drachms, glycerine 1 drachm, water 6 ounces. It is seldom I intensify; if I do, I add a drop or two of a 35-grain solution of silver to the above developer, and intensify with that. I fix on the spot with hyposulphite of soda.

The toning bath is that excellent one composed of gold, 1 grain; chloride of lime, 1 grain; *boiling water*, 1 pint; with a pinch of precipitated chalk added. There are four great advantages attending this bath:—1. There is no washing of prints required before toning, as they go direct from the printing frames into the bath. 2. It can be used immediately when cold. 3. Almost any tone can be gained by it. 4. Last—but not least—it is as economical as any bath known, and is very speedy in its action.

I think half the thousand-and-one processes that are continually written about and printed might be condensed into one word, *cleanliness*—a receipt for half the success in photography. My stereographs, as the result of the above simple formula, combined with a fair amount of clean manipulation, prove, I think, my statement. Patent plate, cleaned with (say) nitric acid and methylated spirits, and finally rubbed with a drop or two of collodion on a rag, and polished with a soft cloth, is my ground to work upon; always avoiding what I consider only an apology for dirt and laziness, "albumenizing." Two layers are enough on the plate, without a third, which in how many cases out of ten means a fourth!

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* Read before the Photographic Society of Great Britain.

As I have given my formula, perhaps I ought to say a word on the lenses I use. Hitherto I have worked with one pair of quick-acting stereo landscape lenses; but these are not suited to all botanical subjects. A small leaf and flower require a longer-focus lens, for the reason that in using the quick-acting stereo landscape—say over the jasmine—the camera, to avoid rendering the flower only a white spot in the picture, must be brought close up to the subject; but then you get what I have previously complained of, unequal balance of pictures—flowers and leaves in the one, that are wanting in the other. By the use of the long-focussed lens this is avoided; the camera need not be brought so near the subject, and at the same time the flower and leaf are represented the necessary size.

I trust soon to start a companion series on collodio-chloride paper, more for the graphoscope than the stereoscope. The former allows a much wider card than the latter; in fact, one has to sadly cut down a picture to fit it for the stereoscope. Personally, I think the finished results on the collodio-chloride paper are infinitely more beautiful than on albumenized paper.

I would conclude these few remarks with an earnest appeal to all, both photographers and the general public, to give stereoscopic photography that amount of respect and attention that it has long lost, but which is nevertheless its rightful and just due.

CUTTING MOUNTS.

We resume our extracts from the useful little "Carver and Gilder's Guide," by reproducing a few hints on the above subject which will especially interest many photographers living far from the metropolis, who, whilst often requiring mounts of especial size, have not facilities for obtaining them to order without much delay and unnecessary cost. The "Guide" says:—

"Mount cutting has become a branch of industry at which hundreds are employed. In small towns the business would not be remunerative, and only in London and the largest towns are mount cutting establishments to be found: and the mounts wanted by country picture frame makers are usually ordered from one of the London houses. Of late years this business has received considerable impetus from the number required in the mounting and framing of photographs, as well as the large number of water-colour and pencil drawings requiring mounts. It is now generally acknowledged that a French cut-out mount, with its smooth bevel, very considerably improves any drawing or photograph, and the advantage of knowing how to cut out a mount to an exact size is apparent to the picture-frame maker, while to the amateur it would be a labour of love.

"Very few frame makers know anything of mount cutting, and however small a mount is required, the order is obliged to be sent to London, or elsewhere, unless it should happen that it is in stock. A few hints on mount cutting may not be out of place here, as with a little practice the country frame maker would be able to oblige a pressing customer with a mount. Oftentimes the London mount cutters are most dilatory in sending off their orders, as well as charging a high price for miscellaneous work.

"There are three things on which we shall say a few words, viz., the material employed, the tools used, and the method of work.

"Cardboard is used for the best mounts, and a commoner board, called mounting board, for cheap work. The cardboard is white throughout its thickness, so that if a water-colour requires a mount without a gold bevel, the bevel shown on the picture is a clean white; with pasteboard this is not the case, as the bevel would not be the same colour as the margin, the inside of the board being made of commoner material. Boards are of various sizes and thicknesses, and the following are the sizes most in use, with their technical names:—

Description.	Size Trimmed.
Antiquarian	53 by 35 inches
Double Imperial	43 ,, 29 ,,
Double Elephant	39½ ,, 26½ ,,
Atlas	33 ,, 26½ ,,
Imperial	29 ,, 21½ ,,
Royal	23 ,, 18½ ,,
Half Imperial	21½ ,, 14½ ,,
Half Royal	18½ ,, 11½ ,,
Quarter Imperial	14½ ,, 10¾ ,,
Quarter Royal	11½ ,, 9¼ ,,

PHOTOGRAPHIC SIZES.

Description.	Size of Opening.
Carte-de-Visite	2¼ by 3½ inches
Quarter Plate	4¼ ,, 3¼ ,,
Half Plate	6½ ,, 4¾ ,,
Whole Plate	8½ ,, 6½ ,,
Cabinet	5½ ,, 4 ,,

The thicknesses are known by the number of sheets of paper in the board, and in the trade is known when called 4-sheet, 6-sheet, 8-sheet, 10-sheet, 12-sheet boards. The first are thin, and become thicker according to the number of sheets. Boards as used by mount cutters can also be had of any tint or colour. Gold and imitation gold paper is used for the bevel of the mounts when cut. Gold ink made from bronze powder is used for the gold line when required.

"The tools used by the trade are few, and need but little description. They may be enumerated as a mount-cutting knife, steel straightedges (one edge bevelled), cardboard cutter, ruling pens, a piece of plate glass, scissors, pencils, knife, oilstone, and a few other appliances.

"The cardboard cutter is a long knife affixed to a stand on which there is a guage, and it trims or cuts cardboard very expeditiously. This article may be had of any dealer in bookbinder's tools. The mount-cutting knife is a straight piece of steel with the end brought to a sharp cutting edge and pointed, and is fastened into a suitable handle by a screw. Steel straightedges may be had from one to three feet in length, and for mount cutters' use one edge is bevelled. Boxwood straightedges, with the inches marked, will also be found indispensable.

"The ruling pen, such an one as is usually found in a case of mathematical instruments, needs no description, neither any of the other small articles mentioned.

"By following the instructions, with practice, any of our readers with an ordinary amount of facility for manipulation will be able to produce a neat mount fit for use.

"Mounts may be cut to any pattern or shape, but the following are recognized shapes for photographs, &c:—Oval, dome, square, cushion, and drawings sometimes look well with mounts the top corners of which are rounded.

"It is usual with water-colours to have the mounts plain, but many require the gold line and bevel, while some prefer gold bevel only. Photographs and other pictures are usually mounted with gold bevel.

"It is necessary, before we cut a mount, to say a few words on the method of holding the knife, or it will be impossible for the tyro to proceed. The knife is screwed into the handle, and it must be held with the screw between the thumb and first finger of the right hand, neither of which must touch it, something like a pen is held, only the handle of the knife, instead of pointing over the shoulder, must be held at a right angle with the body in a sloping direction outward, with the hand laid ready for moving on the last finger. The cut is toward the operator, and the knife must be held very firmly, the hand moving altogether, the downward pressure being given with the thumb and finger, and the cut is given with the outstretched arm brought towards the body as in cutting glass.

(To be continued.)

The Photographic News.

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PINHOLES AND NITRATE OF BARYTA.

The presence of pinholes in the negative film is one of the most irritating troubles to which the photographer is liable, and, unfortunately, it is, at the same time, one of the most common. As a rule, it arises from the bath having been overworked, and so having become weak in nitrate of silver, and over-charged with iodide of silver. The remedy in such cases is a very simple one. It consists in pouring the weakened bath slowly into an equal bulk of distilled water, by which the solution is much diluted, and the excess of iodide, being quite insoluble in a very weak solution, is precipitated, and may be filtered out. The addition of crystals of nitrate of silver—generally about forty grains for each ounce of distilled water added—sufficient to restore the whole bulk of the solution to the proper strength, generally yields a good bath which works well without pinholes.

A simpler plan than this proves successful in many hands. It consists in the addition of a few drops of hydrochloric acid to the supersaturated solution, which forms a precipitate of chloride of silver, which in falling takes with it the excess of iodide of silver. The tendency of a precipitate formed this way to take down with it other matter in suspension, or in an imperfect state of solution, is well known, but it has not been found easy to remove iodide of silver in that way. The suddenness of the decomposition, produced by hydrochloric acid, seems, however, to favour this process, and the excess of iodide of silver, being in a state of tottering equilibrium ready to be taken down on the surface of the plate, in which a rapid double decomposition is taking place, is equally ready to go down with the chloride formed by a decomposition in which the affinities are nearly equal in strength. The precipitate is then removed by filtration, and the bath is usually found in good order.

The method which of late has been largely adopted, and with general advantage, is the addition of a baryta salt to the solution, which has yielded sandy looking films issuing in pinholes. The most common addition is nitrate of baryta in varying proportions. This, in the greater number of cases, at once yields immunity from pinholes. The theory of its action remains unexplained. When it was first proposed, many years ago, by Dr. Vogel, to remove pinholes caused by the presence of sulphate of silver in the bath, the theory of its action was clear enough. The superior affinity of sulphur for baryta caused a decomposition at once in which the sulphuric acid combined with the baryta, producing a precipitate of sulphate of baryta; whilst the nitric acid combined with the liberated silver to form nitrate of silver. If we suppose that all the cases in which the addition of nitrate of baryta to the bath has removed pinholes, sulphate of silver has been the mischievous agent, the theory would be clear enough. But it scarcely seems probable that this is so. In the case of Mr. York, who somewhat more than twelve months since detailed his experiences before the South London Society, there seems reason to believe that sulphate of silver must have been present in his solution, as he describes the presence of a manifest precipitate on adding the nitrate of baryta, which was renewed on each addition up to five grains per ounce, when it ceased. Mr. York, moreover, found the addition of sulphate of baryta quite useless, whilst Captain Abney and others have found the sulphate as efficient as the nitrate. The practical photographer is, however, more concerned about results than theories, and it is only when discrepancies in results arise that he is seriously concerned. It unfortunately happens that when discrepancies arise, true theory becomes most needful to aid in tracing the cause of the discrepant action. In many cases lately we learn that the addition of nitrate of baryta has failed to remove the pinholes for which, in other apparently similar cases, it has been a satisfactory remedy. So far as we can glean from the experiences which reach us, the quantity is an important factor in the matter, excess of the remedy in some cases absolutely producing an evil similar to that it was intended to remove. Various authorities have given different proportions ranging from three grains of the nitrate of baryta to ten grains to the ounce of nitrate of silver solution. In the majority of cases about three grains per ounce seem to give the best results, five grains being a maximum. A correspondent, Mr. E. Williams, of Hawkhurst, writes as follows:—

"From what is said in the Photographic News it seems that nitrate of baryta is not much understood so far as it concerns photography, but having used it about two years I have found out some of its fancies. A correspondent recently complained of pinholes with it in the bath. I have always found that six grains to the ounce will work sandy, that with three grains the result is perfect, but if the plate be not fully sensitized a fine crop of pinholes will result, but when well sensitized not one will be seen. A somewhat long stay in the nitrate bath does no harm. I always use the bath saturated with carbonate of soda, and find that the baryta after about one month tends to some exaggeration of high lights if the exposure be too long, but not otherwise."

We shall be glad to receive details of the experience of other readers, as from the comparison of varied experience trustworthy conclusions can only be drawn.

APPLICATIONS OF PHOTOGRAPHY TO THE CULTIVATION OF SCIENCE, ARTS, ETC., IN FRANCE, AS EXEMPLIFIED BY THE RECENT PARIS EXHIBITION.

BY M. A. DAVANNE.*

As regards the use that may be made of photography in warfare, it was only to be expected that neither France nor any other power would exhibit how much can be done by the camera in this connection. It cannot, however, be denied that photography is very useful in connection with the army. Whenever a sketch has to be taken, or a fact verified, the camera and the dry processes give us a far more faithful and more rapid image than the pencil of an officer. Added to this there are instances in which the authentic reproduction of documents by photo-lithography, or by the ordinary process, is of considerable importance, and thus it will be seen that the establishment of a photographic staff in connection with the army is a measure that cannot fail to give useful results.

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* Continued from page 560.

Among the applications made of photography in time of war we may remind our readers of one of the most important and most well known. The service of despatches organized by M. Dagron during the last months of the war of 1870 71, made it possible to confide to one single pigeon, without harrassing or weighting the bird, any number of printed despatches. The printing was done upon thin pellicles, and was reproduced as many times as might seem desirable, the mode of ensuring safety in delivery being by confiding the same message to a large number of these winged messengers. We are occupied just now, it appears, in training pigeons for this service, and it would be equally well if some pains were taken to instruct operators in the task of printing these delicate missives.

While on the subject, we may mention another matter which has been attempted with much success by M. Dagron. The foreign and civil wars have on many occasions contributed to the irreparable loss of documents of value, whether of an administrative, judiciary, or financial character. Even in times of peace such documents are not always safe. Here again micro-photography, or, if it may be termed semi-micro-photography, may assist and act as an insurance medium against total loss. It would be easy to have all such documents copied on a small scale and then collected in a small space, to be referred to and consulted in case of any accidents happening to the originals.

In matters of finance the same facility of copying documents with certainty and facility is also of importance. For producing complicated designs of a microscopic nature to serve as the groundwork of cheques and banking documents, the use of the camera and of photo-engraving is widely applied.

The Russian Government, appreciating the services which might be anticipated from these processes, has organised, under the name of *Institute for the Manufacture of State Papers*, a special atelier, under the direction of General Winberg, who forwarded to our exhibition a very beautiful collection of specimens comprising more than one hundred different productions. The collection contained engraved plates in *relief* and in *intaglio*, and engravings and etchings, all of which were the work of M. Scamoni, the chief of the photo-engraving establishment of the *Institute*. M. Scamoni also sent specimens of several other processes in greasy ink, to show that the photographic establishment at the Ministry of Finance was also familiar with such processes.

At the Bank of France, some experiments have been made touching the manufacture of bank notes and State papers; but it is to be regretted that not a single specimen of the work was exhibited to show what had been done in the matter. In fact, there are not in Paris any signs of that energy in the matter which exists in the Paper State Office of Russia.

Among the number of offices in the French Department of Public Works, where photography is employed with advantage, only three sent examples of their work to the Exhibition in Paris, namely, the school of *Ponts et Chaussees*, the Direction of Lighthouses, and the School of Mines.

The school of *Ponts et Chaussees*, directed by M. Jegon 'Herbeline, is, perhaps, the only section attached to the office of works which has a photographic studio of its own. The studio and staff are insufficient for the services which it is called upon to perform; but there is hope that it will assume a greater importance as soon as the building improvements which are going on have been completed, and more space is allotted to the institute.

Such as it is, however, the photographic establishment suffices to give the students some idea of photographic manipulations; and, indeed, the time required for their studies permits them to obtain scarcely anything more. But it is much to be desired that the studio at the school of *Ponts et Chaussees* will become, in imitation of the *Depot d'Artillerie*, a kind of central establishment to which will be attached secondary establishments in all the principal divisions of the service. The *personnel* could be easily recruited from *employes* in the service, and these could receive at the central atelier such instruction and practice as might be necessary. In this way there would be at the disposal of Government Engineers properly trained photographers, and the former, who often employ the camera, would be saved the expense to which they are frequently put, and at the same time have the service of a staff specially practised in the work to be performed.

In the department of *Ponts et Chaussees* the work consists in taking photographs of finished buildings and those in course of erection, of reproducing surveys and plans, &c.; it is also employed in reproducing maps of divers scales to one and the same scale—a work in which the camera is particularly useful.

In the Direction of Lighthouses, M. L. Reynaud, the director, utilises photography to bring to any desired scale plans which are executed of large dimensions, so as to obtain the utmost amount of precision; and from a practical point of view he has also taken photographic images of the various flames employed in the lighthouses, such flames being of different kinds according to the service on which they are used. Such photographs, having been carefully prepared, are sent round to the lighthouse-keepers at various stations, to serve as guides, and as indicators to show the proper height of the various flames. The photographs thus serve a most useful purpose, and the lighthouse-keepers strive to maintain their lights upon the same scale as that indicated by the photograph.

In the School of Mines, photography is applied in much the same manner as in the school of *Ponts et Chaussees*; one of the most curious illustrations may be cited, namely, the collection of M. Michel Levy, who has exhibited his micro-photographic study of eruptive rocks.

Other Governments, and especially that of Portugal, have made considerable use of photography in their public departments. M. Rodrigues, whose name is well known as an ardent worker at photo-mechanical processes, forwarded to the Exhibition a most interesting collection of specimens representing various processes and the uses to which they were put.

(*To be continued.*)

NESBITT'S TINTING FRAME.

THE practice of printing ornamental and plain borders to carte and cabinet photographs is now so general that some efficient mechanical means of performing the operation has become almost imperatively necessary. The frame devised by M. Lambert for registering the double-printed borders in his chromotypes is excellent, but rather elaborate. The method of fitting the print to the border negative by hand is very uncertain in silver, and impossible in carbon, often giving in the former an unsightly white line round part of the oval or square. To obviate these and other difficulties, Mr. Nesbitt, of Bournemouth, has patented and introduced an ingenious apparatus, which is as efficient as it is simple.

In an operation like printing, anything cumbersome, complicated, or intricate becomes worse than useless, because it is absolutely prohibitory of the effects it is intended to secure. Simplicity and lightness are the especial claims of Mr. Nesbitt's Universal Tinter, and as cheapness is an added merit, it becomes more valuable, as it will tempt many to make the experiment of a trial who might hesitate to purchase costly apparatus on chance. It is difficult to convey any adequate idea of the precise mechanical details by written description. Of course there are matts and corresponding discs of different sizes and proportions, and also the tinting glass with names, addresses, &c., printed thereon; but the especial excellence consists in the simplicity and ease with which these are fixed, so as to secure absolutely accurate registration without the bungling look which is too frequently seen in in many prints with tinted entourage. Mr. Nesbitt's circular so admirably states the aim of his invention that we cannot do better than quote a portion, simply remarking that in our view his claims do not seem to be overstated.

> This invention surpasses both in utility and simplicity anything of the kind introduced to the profession. The patent presses now in use are cumbersome and expensive, whilst mine are small and inexpensive; moreover, any injury by accident is easily remedied. For instance, if a name plate should be broken, it can be replaced at once, as can also the discs.
>
> The title of any picture can be introduced if desired, as well as the name and address of the photographer, and changed at pleasure. The tinter can be used for the single and double transfer, or for silver processes.
>
> The right line on one side of an oval, so objectionable from being lighter than any other part of the picture, and so liable to wash up in developing carbon prints, is entirely obviated, and perfect registration guaranteed, so that no line will show.
>
> The frame is no larger than an ordinary quarter-plate printing frame, and its construction is so simple and exact that it can be used by the most inexperienced printer with perfect results. No special printing frame is required, and any shape or size can be used, so that a printer having six of my tinters can, by adjusting the proper masks, tint six of one shape at one time, thereby insuring the same depth of tint: the discs can then be removed, and any other size or shape substituted.

PHOTOGRAPHY IN MELBOURNE.

BY NELSON K. CHERRILL.

I arrived in Melbourne on Sunday, the 9th of July, after one of the most wonderful passages on record. We were only forty-two days for the whole voyage from England; this is about three days less than the same journey has ever been done in before. If any of your readers should ever happen to want to go to Melbourne, I should advise them to go by the *Whampoa*, as by so doing they will obtain for themselves all the comforts that can be obtained in the highest class of steamships. On our voyage out, I took a number of photographs of the ship, the passengers, the crew, &c., and most of these were very successful. I sent you an account of this experiment from Melbourne just after I landed, and I hope the same has reached you in due course.

As I stayed in Melbourne about ten days, I had time to see a good deal of what was going on there, and, in particular, I saw much of the doings of the photographic community.

There is a tremendous amount of photography done in Melbourne, but I should say that there are more photographers there than in any city of its size I know of. The average is about half-a-dozen studios in each of the principal streets. Wages and rents are high, and chemicals dear, whilst the prices charged for the pictures are not much above English rates; so that, commercially, photography does not look any better, if so well, in the "Queen of the South," as they call Melbourne, as it does in the old country; but, for all that, the trade must be "going on," or there would not be such an immense number of studios in full work. I visited some of the best studios in the city; they are mostly on the ridge-root principle, with one set of white blinds, "Rembrandts" and "special effects" of lighting not being, as a rule, much sought after. The public in Melbourne is, perhaps, a trifle indifferent as to the art qualities of the photographs it buys, and this indifference has had, in some cases, the inevitable effect of rendering the photographer careless and indifferent too. There are, however, many studios where very first rate work is turned out.

Melbourne rejoices in a photographic society, at a meeting of which I had the pleasure to be present. The society boasts of two or three score of members, and though but newly started, talks of setting up an annual exhibition. It is a little deterred, however, at the present by an unruly member, who threatens to have an exact model of his shop-front made and fixed up as one side of that exhibition. Hearing of this reminded me of the critique of the photographic department of the International Exhibition opened in Melbourne in 1872; you will find it in your number for January 17th, 1873. In this curious specimen of art criticism the exhibits are praised in exact proportion to their money value, Mr. J. P Mayall's contribution being specially praised, being of the value of about £170. I saw Mr. Mayall's studio, but he had left for England only a few days before I arrived out. There is a magnificent observatory at Melbourne, and in it a remarkably fine reflecting telescope of about four feet aperture and thirty feet focal distance. This instrument is fitted with all the latest appliances for photography, and the astronomer-artist who has the management of this department has secured some results which are among the finest I have seen. Some of the photographs of the moon taken at the Melbourne Observatory surpass any that have been done before. The telescope is provided with an enlarging eye-piece, by which the image of the moon is projected at once of the full size on the plate; this seems to be a great advantage, as the photograph so taken is much more beautiful than those which are taken small, and subsequently enlarged.

When I left England, I was told that I should find all things in the Colonies about fifty years "behind the age." Photography in Melbourne is not fifty, but it is five (if not ten) years behind-hand. There is not a carbon print in the city, and, as far as I could learn, no one in the Colony knows anything practically about the process. Then, too, there is an almost complete absence of the many little extra processes, if I may so call them, which adorn most of our English studios. I did not see an enamel there, although I am informed there is one gentleman who devotes his attention to this branch of the art. In fact, photography in Melbourne seems almost entirely to run on the trade production of small portraits; there are, as I have said, exceptions, but the rule is trade rather than the more advanced state of the art. Under these circumstances there is a good opening there now for a few first-class operators, especially such as can introduce novelties such as carbon printing, enamels, &c., ivory printing, opal work, &c. First-class operators are getting from four to six guineas per week in Melbourne, and in some instances as much as seven to eight; but these are, as I believe, exceptional.

There was one item in the supply of material in Melbourne which seemed to me of surpassing excellence; it was the albumenized paper. In the bright genial climate of the southern hemisphere eggs are plentiful, as indeed are all natural productions; in consequence, albumenized paper is prepared with egg albumen, and the eggs used are fresh. Mr. Bovey can, better than any one I am acquainted with, estimate the advantage gained by the use of really good new laid eggs in the preparation of albumenized paper: whatever that advantage amounts to, it is at present in the hands of Melbourne photographers. As a practical result, in my mind strongly connected with this very point, I might mention that I did not see a single faded photograph in any of the studio windows; indeed, fading seems almost unknown out in Melbourne—at any rate. that rapid decay which in my experience often ruined portraits before they could be sent home to customers, has no existence whatever when the paper I have been speaking of is used.

I am building a studio here, and hope in the course of a few mails to be able to send you notes on a variety of topics of more or less interest, and especially on landscape work. There is out here scope for landscape photography unequalled, I should say, by any country in the world. The bulk of the work is, however, in places far away "up country," and along the "West Coast," where communications are such as to promise much adventure and not a little fun.

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FURTHER PARTICULARS OF THE LEAD INTENSIFYING PROCESS.

BY DR. J. M. EDER AND CAPT. V. TOTH.*

[Those of our readers who have had recourse to the excellent nitrate of lead developer of MM. Eder and Toth will be interested in the particulars of further information on the point, as also in the more recent experiments which those gentlemen now record. The details of the nitrate of lead developer we have published more than once in these columns, and we can heartily recommend it for photolithographic and other work when very dense, and at the same time clear, negatives are required. As regards its intensifying power, it may be said to compare with the ordinary bichloride of mercury intensifier as three to one.—Ed. P.N.]

Notwithstanding the fact that our process of intensifying has been successfully applied by many, we have received from various sides complaints of this or that difficulty with which photographers have had to contend. Although such difficulties were scarcely anticipated by us, we have thought it desirable to make a further communication on the subject, in order to describe the method more at length; as also to mention the results of some further experiments we have made.

Sometimes negatives may be seen which before being intensified with lead appear clear, and afterwards are afflicted with fog, which covers the finer details. The question naturally arises, Was the cause of the fog in the negative before the intensifying process was begun, or is it to be sought in the latter itself; in other words, would the intensifier have fogged a perfectly faultless negative? The answer to this is simply that if the intensifier is properly applied no fogging is the result; but that an incipient fogging previously existed, which has been rendered so pronounced by the intensifying action of the solution as to damage the negative by permitting very little light to go through.

In the case of a very clear negative, as one of us has already proved, the action of the lead intensifier is a purely chemical one, and only where silver is can any intensifying action take place; therefore no fogging can follow the application of the solution. If, however, it is desired to employ the lead intensifier in the case of a negative which is not quite clear, then the solution must not be employed at its full strength, or the use of a clarifying liquid must be had recourse to. This may be applied either before or after the lead intensifier. Here, however, we will only refer to one for application before the intensifier. An excellent medium for the purpose is the oft-recommended iodine, which is best applied before fixing. A solution containing one to two parts of iodine, and three to four parts of iodide of potassium, and which is made up of one hundred parts of water, is poured upon the plate and allowed to remain so long that the blacks have become perfectly yellow, when it is quickly washed off and the plate fixed. The finest silver particles, which constitute the fog, are first of all attacked by the iodine solution, and changed into yellow iodide of silver; if the treatment was continued long enough the whole image would be changed into iodide, which would then be dissolved away on the application of the hyposulphite solution. If properly handled, however, the picture is cleared and slightly weakened, but this is of little moment in the case of intensifying with lead. Cyanide of potassium, or any other clarifying medium, might be employed with similar effect.

Methods for the purpose of clarifying negatives that have already been intensified by the lead process we will specify hereafter.

All these precautionary measures are, however, only required in exceptional cases when one has to do with fogged negatives. A perfectly clear negative remains so after the intensifying process, notwithstanding the circumstance of the silver portions having been rendered opaque. If anybody obtains fogging with the use of the lead intensifier, it is a proof that he had not a suitable negative to manipulate, and was not justified in considering it a perfect picture free from fog. The lead intensifier is indeed an excellent means for discovering whether an image is perfectly clear or not, and may be regarded as a very good touchstone. It is very easy, by exposing and developing briefly, to secure clear negatives in which the background is perfectly transparent and the image marked, if not very dense, and in the treatment of such clichés as these there should be no difficulty; any defect is, indeed, to be sought in the negative process, and not in the intensifier. We make special mention of this circumstance, so that photographers may not make the mistake of putting the saddle on the wrong horse.

By careless application of the lead intensifier, it is possible, moreover, to fog also clear negatives. Hyposulphite of soda turns red prussiate of potash into yellow, which then produces a blue precipitate (ferrocyanide) on the addition of the nitrate of lead. If, therefore, the first is contained in the negative, fogging will ensue by the addition of the lead solution. In the same way cyanide of potassium forms insoluble cyanide blue, and images fixed with cyanide which have been badly washed are also afflicted with fog for this reason. It is good, therefore, to wash very thoroughly always after fixing, just as if the negative was about to be varnished and put away.

It is probable that we laid too much stress in our previous communication upon the employment of distilled water (for rinsing), for the spring water at our disposal was exceedingly hard, and contained large quantities of chlorides and sulphates; but if water is pure, it may be used very well instead of distilled water.

Acetate of lead (sugar of lead) is a cause of fogging if employed instead of sulphate, as it absorbs carbonic acid from the atmosphere, and the carbonate of lead produced covers the plate uniformly. We called attention to this circumstance before, and then recommended sulphate of lead.

We may here also remark that the concentrated lead bath has not only the advantage of working rapidly, but has also the property of keeping better than the more dilute liquid. For this is a peculiar feature of red prussiate of potash, that it decomposes more rapidly in a dilute form, giving rise to yellow prussiate, than when in a concentrated solution.

(To be continued.)

◆

Correspondence.

MEDALS AT THE PHILADELPHIA EXHIBITION.

Dear Sir,—I cannot help but express my surprise at your remarks upon the above subject in your last issue.

In the first place, I cannot understand why you put the number of British exhibitors at twenty-six, while in the official catalogue are thirty-six names, under the head of "Photographs," and taking out the Etching Company and J. H. Dallmeyer, and perhaps one or two others, there are still left thirty-two, instead of twenty-six. Of course the Official Catalogue may be mistaken, or there may be more apparatus and lens makers in the list than I know of; but I am naturally anxious that Great Britain shall in your columns, as elsewhere, stand in numbers as well as she really deserves. But it is not this, so much as your ungracious and disparaging remarks at the end of your article that causes pain, wherein you say:—"The awards to British photographers surprise us when we compare the recipients with those passed over," &c.; and, "The race is not always to the swift, nor the battle to the strong, and those who have failed must take consolation in the reflection that it is better to merit than to win." (?)

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* *Photographische Correspondenz.*

I have refrained from giving the names you have quoted, the excellence of whose work no photographer would dare to doubt, and whose abilities we all honour and emulate, because I do not for a moment believe they would endorse your ungenerous remarks, or seek to elevate themselves at the expense of others; nor would they echo your palpable inference that those who have received medals from America do not "merit" them.

I recollect, two or more years ago, certain prizes were given in connection, directly or indirectly, with the Photographic Society. I also recollect that the judges' decisions were called in question, and I believe that you upheld those decisions as just and fair (?) I never have, nor am I going now to question those awards, but I cannot very well see how any one here can with justice challenge the American judges, as you practically do, with having acted unfairly, and I do not think you ought to do so, even by inference.

At any rate, as far as English exhibitors are concerned, it cannot be said that favouritism influenced them, nor do I see that you have any right to question their ability of judging, nor attempt to depreciate the honours of those who have succeeded, and who, in future years, can point with pleasure at the trophies of their hard-earned victories.—I have the honour to remain yours truly, Fk. Hudson.

Ventnor, Isle of Wight.

[Our correspondent has curiously misread our remarks, or misconceived their intent, which is neither ungracious nor disparaging. We will briefly answer his questions and observations seriatim. (1) As we distinctly stated at the outset of our article, the statistics were derived from our Philadelphia contemporary. For their accuracy we were in no way responsible; but we find on investigation that they were in the main correct. In the Official Catalogue, in "Class 430, Photographs," there are thirty-two names; one of these having no entries in the class. To four of the names an address in Ireland is attached, and these our contemporary has doubtless omitted from Great Britain. (2) We do not disparage the recipients of the medals in the least. We do not doubt for a moment that the awards were worthily given. As regards Mr. Hudson, at least, he knows we have acted before where we have had pleasure in awarding his works a medal. But still we express surprise when we compare names like those of Mr. Crawshay, Mr. Slingsby, Mr. England, G. W. Wilson, and others, amongst the non-recipients, with those of some of the recipients. We rejoice at the success of the latter, and still marvel at the passing over of some of our ablest men. (3) We have, as your remarks recall, been too frequently on such juries to readily believe that decisions are given with intentional unfairness, still less with favouritism; we never object to criticism of such decisions. But of course the value of the criticisms entirely depends on the quality of the critic. We never even remotely suggested unfairness in the American jury; but we wondered at the process by which their decisions were attained. Since we wrote we have examined the constitution of the jury and the principle upon which it was framed we wonder less. In the Philadelphia Exhibition an admittedly new system of constituting juries was adopted, the new plan being an experiment. We have not time or space to discuss it here; but in its result we find that for Great Britain there was no representative of photography whatever. So far as we can glean, it is probable that the photographic awards were chiefly made by non-photographers. In such a case, whilst it is probable that no award might be made unworthily, yet, for lack of cultivated perception, many omissions might be made. Our correspondent's sympathy is with the prize-winners, whom he erroneously thinks we depreciate. But surely we may, without slighting the winners, sympathize with those who at least endeavoured well, and were still left uncrowned. A glance at the fate of the great painters who exhibited may, however, console them. We find at the same exhibition, amongst the painters who received no recognition, the names of Millais, Marks, Henry Moore, Poynter, Erskine Nicol, Ouless, Pettie, Sant, Calderon, Hook, Holman, Hunt, and a host of others, their peers: all these were left out in the cold, unrecognized as worthy of awards.—Ed.]

A CENTENARIAN.

Dear Sir,—The enclosed portrait was taken by me on the first of this month, in a room, and without any head-rests. I simply mention this to the credit of my sitter, whose name I am not at liberty to divulge, because, as she told me, she and all her family have always had a great objection to notoriety of any kind.

I may tell you that I first made the acquaintance of this lady when she was eighty-five. I photographed her for the second time when she was ninety, for the third time when she was ninety-five, and I then expressed the hope that I might do her homage on her hundredth birthday, by photographing her at her own residence, and offering her a bouquet of flowers for acceptance.

The hope has been fulfilled and the promise kept; but the most extraordinary part of my narrative has yet to be told. Some three weeks after she had reached her hundredth year, I had the pleasure of sitting with her in her drawing room, and in the course of a pleasant conversation I learnt that she enjoys perfect physical and mental health, reads and writes without spectacles, and learns poetry by heart as a recreation. She has an excellent memory, and remembers all that has happened since she was ten years of age. She belongs to a good old Liverpool family, is a lady by birth and education, and has very decided opinions on matters of politics and fashion. In one day she received sixty-three visitors, and was able to see her friends, and converse with them all. A young friend of hers, as she told me with a smile, who is only eighty-five, came all the way from Manchester to congratulate her, and as he is of a different shade of politics to hers, she took occasion to speak in unmistakable terms of disapproval of a high personage, with whose origin and history she is thoroughly conversant, and who is well known in Liberal circles. I may add that when she was over ninety-six years of age she met with a serious accident. She had a dangerous fall, which would certainly have proved fatal to many much younger than herself; but such is the nature of her constitution that after a few weeks she had completely recovered.

In remembrance of the 1st of November she has presented my young son with a handsomely bound book, in which she has written an inscription in a firm and legible hand. This good lady is unmarried, and is one of a family of sixteen children. In an old family Bible (large size) where all the names of her brothers and sisters are entered also, I have read opposite her own name—"Born October 8th, 1776."

I can see no reason why another decade should not be added to the already great number of her years, a consummation which, if it be for her happiness, I sincerely wish her: and remain, faithfully yours, C. Ferranti.

November 27th.

[We are indebted to our correspondent for copy of the excellent portrait obtained of the grand old lady. Easy, natural, and she has sat without a movement, the well-cut face being admirably rendered. A firm, self-reliant, but not hard face, with a well-formed nose, and good chin and jaw, and fine forehead. The photograph, though rapidly taken, has done the sitter full justice.—Ed.]

MISQUOTATION.

Sir,—Butler wrote good English. Why are these lines always misquoted?—

"A man *convinced* against his will
Is of the same opinion still."

The words are—

"He who *complies* against his will
Is of the same opinion still."

If he is *convinced*, his opinion is necessarily changed (see Photographic News, page 555, November 24, 1876).

Nemo.

[Our correspondent must see that we are not answerable for the misquotation. Butler wrote—

"He that complies against his will
Is of his own opinion still." Ed.]

Proceedings of Societies.

West Riding of Yorkshire Photographic Society.

The above Society commenced its third session on Monday, the 6th November, at the Commercial Hotel, Bradford—the president, Mr. John Smith, in the chair.

The minutes of the last meeting having been read and received confirmation, the Secretary read the Annual Report as follows:—

"In presenting this, the second Annual Report, your Council have to congratulate the Society on its condition. But few members have retired, and numerically the Society is as strong as during the last session. Some slight alterations in the rules have been made with advantage to the Society. Shortly after commencing the session, the departure of Mr. Gough for India caused a vacancy in the presidential chair. The Society held a special meeting for the purpose of expressing their esteem and wishing him "God speed," and success to the undertaking.

The papers read during the session have been as follow:—'On Darkness and Disease,' a communication from Mr. D. Winstanley; 'The Hot-water Process,' by Mr. H. Beedon; 'On Art and Photography,' by Mr. J. Crosthwaite; 'On Bath *v.* Emulsion,' by Mr. W. E. Burrow. Mr. Tilley, of Stafford, attended one of the meetings, and gave a demonstration of his combination negative process; and Mr. Sachs obtained and exhibited a number of M. Leon Vidal's photochromes.

An excursion was held to "Gost Stock," Bingley, which was numerously attended and enjoyed by all present.

As in last year, death has removed one member, Mr. A. Gledhill.

Many matters of interest have been laid before the Society in an informal manner, and at each meeting there has existed a pleasant and communicative feeling, which it is very desirable to retain. At the same time your Council feel the desirability of a certain quantity of definite matter being appointed for each evening of meeting, so as to give the members an opportunity of considering the subject before coming to the meeting, and, if necessary, discussing it. With this view your Council have prepared a scheme which will, they think, with your approval, lead to that end. The Council beg most sincerely to thank all those who have in any way contributed to the welfare of the Society and the utility of its meetings, and would respectfully urge upon each and all to do their utmost to retain the Society in its present state of healthy vitality."

The financial statement was then presented, which was of a highly satisfactory character. The report and balance sheet having been passed, the Society proceeded to the election of officers for the ensuing session, with the following results:—

President—Mr. J. Smith.

Vice-President—Mr. W. Cooke.

Treasurer—Mr. Passingham.

Auditor—Mr. A. Megson.

Secretaries—Messrs. Newsome and W. G. Thompson.

Councillors, in place of the four retiring—Messrs. J. Crosthwaite, R. Holgate, R. Broadhead, and J. Gunston.

The usual votes of thanks were then passed to the retiring officers; after which the following proposition, moved by Mr. Crosthwaite, seconded by Mr. A. W. Beer, was placed before the meeting, and, after a close and vigorous discussion, passed:—"That a ballot be taken at each annual meeting to decide the order in which members shall contribute papers to the Society's meetings on subjects prearranged and recommended by Council. Should any member feel indisposed to take the subject appointed, he may, by applying to Council, adopt another, find an acceptable substitute, or pay a fine. The method of determining the order of subjects shall be as follows:—At the annual meeting subjects shall be announced for three meetings in advance, and at each succeeding meeting the subject for the third following meeting shall be determined and announced." A ballot of names and subjects was then taken in accordance with the resolution, and the meeting adjourned.

The Annual Soiree

Was held on Wednesday, the 22nd inst., at the "Belle Vue" Hotel, Bradford. Tea was provided at 5 p.m. by Mr. Clark, proprietor of the hotel, in most ample and elegant style, to which full justice was done by seventy members and visitors. A large number of pictures of a very high order of merit were on exhibition.

The Autotype Company exhibited four frames of Autotype prints from direct negatives, and prints from reproduced negatives.

Messrs. Chaffin and Sons, Yeovil, contributed six large direct pictures, 26×20, of groups and single figures, which were good specimens of manipulation, "Belle and Bow," and "A Musical Trio," being the most generally admired.

The Platinotype Co. showed some excellent specimens of their process, which appeared to be peculiarly adapted for enlargement for colouring upon, the surface taking colour admirably.

Mr. Watson (Hull) sent a few burnt-in enamels of a very high character.

Mr. Sampson exhibited a number of landscapes.

A very large number of chromotypes were exhibited by Messrs. A. Sachs (Bradford), T. Illingworth (Halifax), and W. Smith (Leeds).

Messrs. Sachs, Illingworth, and McGreaves (Halifax) also exhibited a number of very fine enlargements of considerable size.

Messrs. Appleton (Bradford) contributed a number of pictures.

Mr. Wormald (Leeds) showed some admirable examples of his large direct landscapes, 26×20.

A few choice specimens of water-colour art, by Messrs. Megson and Arundel, added to the enjoyment of the exhibition.

A magnificent shade of skeleton leaves was shown by Mr. Cussons, which drew forth, from the ladies especially, many expressions of eulogy.

M. Warnerke sent for exhibition a large number of tissue negatives and transparencies, which were considered by many professional brethren to be of very great excellence, and equal to the best that could be produced by the ordinary wet process. M. Warnerke also showed one of his roller dark slides, and sundry specimens showing his process throughout; also one of Jonte's combined cameras and changing boxes, which, for excellence of workmanship and mechanical accuracy in its various movements for changing and exposing the plate, could not well be surpassed.

Mr. Hare sent one of his well-known changing boxes and cameras, and a small portable camera and dark slide for dry-plate work, which fully upheld the reputation of the maker.

One feature of the exhibition was noticeable as indicating the gradual change coming over photography. With the exception of two of the exhibits, all the pictures shown were in permanent carbon.

Some time having been spent in examining the pictures, the President, Mr. John Smith, gave a short address to the assembled company, congratulating the Society on reaching the third year of its existence; and in returning thanks for his re-election to office, mentioned Mr. Gough, the late president, in terms of eulogy, and stated that Mrs. Gough was now on her way to join him. They could not forget that the last time they met, Mr. Gough held the position of president. However permanent photographs might be made, associations could not be made equally so; but the art of the photographer went a great way in aiding their permanency. It was capable of affording intense pleasure, by reviving in a measure the faces of dear and departed friends, and presenting to the eye familiar and beloved scenes, thus affording comfort and consolation to many. The Society might congratulate itself upon a successful session. The meetings, if not productive of great novelties, had still been of much use, and of a most enjoyable character; and he was proud to say that nothing had occurred during the year to break the pleasant harmony existing among the members, the result of the year's labours being a full determination on the part of all connected with the Association to aid in making its future career more interesting and instructive. A duty lay upon the photographer, that of endeavouring to elevate the public mind to a keener perception of the beautiful, which could only be done by executing conscientious and good work; and he thought, looking over the walls of the room, that the West Riding photographers could compare favourably with any he had seen for artistic excellence. He thought the thanks of the Society were due to the hanging committee and the two honorary secretaries for the energetic manner in which they had performed their duties, which had contributed so largely to the success of the meeting. He was also happy to see so many ladies present, and sincerely hoped to see their faces again on many future and similar occasions.

After music, readings, and recitations, the usual votes of thanks to the chairman, the host and hostess, and the contributors to the evening's entertainment, the proceedings concluded; all agreeing that they had been of a most pleasurable nature.

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Talk in the Studio.

Photographic Reproduction.—The *Daily News*, in its notice of Current Literature, thus testifies its appreciation of the value of photography:—"The facsimile reprint of the first edition of the 'Pilgrim's Progress' possesses some interest for the admirers of Bunyan; but it is to be regretted that the book has not been reproduced by the photographic process employed in the case of the facsimile of Walton's 'Complete Angler.' It seems to have been printed with careful regard to the typographical and other quaint peculiarities of the original, now so scarce a book that only one copy is known to exist. It is impossible, however, for the reader to feel in it the confidence which he must necessarily feel in a photographic copy. What Shakespearian scholar, for example, would use Mr. Booth's facsimile reprint of the folio of 1623, if he could procure Messrs. Chatto and Windus's photographic reproduction?" Mr. Elliot Stock, publisher of the work referred to, writes to our daily contemporary as follows in reference to the foregoing comments:—"Would you allow me to remove an impression which will, I fear, be produced by your notice concerning my facsimile edition of the 'Pilgrim's Progress,' viz.: that this work could have been made more nearly a facsimile of the original if it had been produced by photography than by the process adopted, viz., letter-press printing? The following extract from the Preface will show that not only is this edition as accurate a copy of the original as it would be if made by photography, but that the type used in its production forms a very interesting link with the time of John Bunyan, which would be lost by any photographic process that might be employed:—'As regards typography, the present edition is strictly a lineal descendant of that of 1678? For the type now used has been cast from moulds made in 1720, which were taken from the Dutch type used for that first issue.' In the case of 'Walton's Angler,' to which you refer, the photographic process was used in consequence of very many of the types found in the original being obsolete."

An Old Hint to Photographers Newly Put.—When taking equestrian portraits, you may submit a copy to the rider, but need not put the *carte* before the horse.—*Funny Folks*.

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To Correspondents.

*** The Year-Book of Photography for 1877.—We again make an appeal to correspondents and readers to aid us in giving to our forthcoming annual the completest possible character. As our readers know, it owes the large esteem it now possesses throughout the world to the fact that it is a practical resume of the observations of many minds, the experience of many workers, and thus becomes a reflex of the actual position of photography in its latest state of progress. To secure this we are indebted to the communications of all the able workers and shrewd observers, both in the ranks of professional and amateur photography, and we now appeal to each and all of our readers for communications of hints and suggestions, however brief, resulting from their practice and observation. The early receipt of copy from our friends will be esteemed a favour.

Barry Ryan.—There is no work solely on the subject of glass houses, nor are photographers agreed as to which is the best. In fact, it is impossible to say that any is best without reference to its purpose, and various other conditions. If you have choice of space, position, and size, and money is not an object, we should recommend visiting a few of the best studios before commencing to build. Or, under other circumstances, read carefully the numerous articles which have appeared in our back volumes and Year-Books. Mr. Slingsby, of Lincoln, one of the ablest portraitists we have, has just patented a new form of studio. Mr. Vanderweyde also patented a studio a year or two ago. If you want to secure extreme simplicity, and have space, the following general hints will prove useful. Let your studio be oblong, with ridge roof, standing east and west, so as to secure a north side light. Length 25 feet; width 12 feet; height 6 feet at eaves, 13 feet at ridge. Glass north roof and side, all except 7 feet at each end, and within 20 inches of the floor. South side glass in roof and sides for about 8 feet. Use Belgian sheet glass. Both ground glass, ribbed glass, and violet or coloured lights, obstruct some light permanently. When light is to be shut out, let it be done with blinds, which can be removed if necessary. A visit to Mr. Slingsby's studio at Lincoln will repay you, we think, from what we hear of its excellence and rapidity.

T. Settle.—The spots on the negative sent appear to be the result of a turbid bath, or turbidity somewhere. It might be in the collodion. But in any case the bath does not seem to be in good condition. We do not know its history; but, so far as we can judge, the proper remedy is a new bath.

P. Rolls.—So far as our experience goes, all preparations of gelatine and bichromate will soften and swell somewhat after prolonged soaking, and acquire a leathery texture. It does not seem well suited for giving a water-proof lining to trays, &c. A mixture of collodion and drying oil answers much better.

W. W.—You may use cubic centimetre and gramme as equivalents. A gramme is nearly 15½ grains, and a cubic centimetre is nearly 17 minims. The proportions of formic acid is about 74 grains. The proportions given in your second letter are about right. In trying the formula we should follow it without omitting anything.

W. B.—In our experience and observation No. 2 is decidedly superior, working better in every way, and giving images free from distortion, which the other (No. 1) does not.

Dublin.—If the interior of the camera is properly blackened, there should be no reflection from its sides. The foggy mist effect, often produced by working on small plates with a large lens of long focus, arises not from reflections in the camera, but from the long space of misty atmosphere which is between the lens and sitter, who is, of course, in such case placed at a great distance from the camera. If there were any reflections in the camera it would be easy to devise a cone, lessening its internal dimensions when in use for small plates.

B. R. D.—The morocco-like markings arise from the collodion being too thick. The ether has evaporated. Dilute with new thin collodion, or add a little pure ether. But be sure that it is pure.

L. F. R.—For small negatives, crown glass may be used with safety; but we should hesitate to using it for large plates. The patent plate substitute is, we believe, very good.

A Novice.—In printing through a medium as thick as a plate of glass it is desirable to use direct sunlight The printing frame should be placed in a deep box or tube, so as to cut off as much as possible lateral rays, which would too seriously destroy the sharpness of the image. The plan of working with two identical negative images, one at each side of the glass, promises very well; but we have not personally tried it. Many plans of softening definition have been proposed and discussed during the last half dozen years, details of which you will find in our back volumes. It would occupy all the space devoted to answering correspondents if we even very briefly described each.

R. Tudor Williams.—We do not know of any one specifically engaged in colouring lantern slides. Mr. York, of Lancaster Road, Notting Hill, will probably undertake such work, as it is done in his establishment.

G. Warrand Haughton.—Many thanks.

C. C. S.—We have your letter, but the prints have not yet arrived We will answer in our next.

Thomas Gaffield.—Received.—Thanks.

Received.—"Men of Mark," Radiometer Notes, &c.

Several correspondents in our next.

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PHOTOGRAPHS REGISTERED.

Messrs. E. Day and Son, Bournemouth,
Four Photographs of Rev. P. F. Eliot.
Messrs. Russell and Sons, Chicester,
Two Photographs—Group of All England Cricketers.
Mr. J. Mack, Belfast,
Three Photographs of Rev. John White.
Mr. J. Marker, Keighley,
Photograph—Group of the Seven Imprisoned Keighley Guardians.

The Photographic News, December 8, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography and the Paris Police—Balloons at the North Pole—Photographic Literature—The Use of the Magnifier in Inspecting Photographs.

Photography and the Paris Police.—It is only a few weeks since that our Paris Correspondent called attention to a criminal case in France in which photography might have cleared up a material doubt in the proceedings if it had only been practised in time. It was a case, too, of life and death, and, therefore, one of the utmost importance, the question turning upon whether the body of a woman which had been found buried in a cellar was naked when discovered, or clothed. One would think that such a point as this could never have been disputed about, but, strange to say, the police and the medical officers were at total variance on the subject. While, on the one hand, it was sworn that the victim (if victim she was) of a murder was found without any clothing at all, a sketch that was made by the medical men who inspected the body showed plainly enough that the latter was, at any rate, partially dressed. As our French Correspondent pointed out at the time, had a photograph been taken of the body the moment it was found, either by means of artificial light in the cellar itself, or under the influence of daylight, such a controversy could never have arisen. As it was, however, the decision was against the accused, and he was condemned to death, a judgment, it seems, which would not have been passed had the jury been convinced that the woman was properly attired; for, under these circumstances, the death might have been caused by accident, as the accused stated to be the case, the woman falling down the stairs during the daytime. In coming to the decision they did, however, the jury believed the woman had been murdered while asleep, and then hidden in the cellar. Another criminal case, which is just now absorbing Paris society from the highest to the lowest, is that of *la femme coupee en deux;* and here the authorities, evidently on their guard not to commit the same error twice, have caused photographs of the victim to be taken before such a proceeding was too late. The mutilated remains of the murdered woman were exposed in the ordinary fashion in the *Morgue* for some days, and at the end of that time a wax bust was modelled of the lifeless clay, and the effigy has now been substituted for the body itself. But, at the same time, the police took the precaution of having the face accurately reproduced by photography, and the pictures scattered by the police seem at last to have been successful in leading to some clue. At any rate, several persons who have seen the photograph are said to entertain no doubt about the person of the victim, and hence the police have been able to get news of the supposed murderer. There cannot be a doubt as to the advisability of employing photography in cases such as these, for the camera is the only, as it is also the most trustworthy, means by which a satisfactory record of the kind can be secured. It would be well, of course, in the case of such photographs, to keep them entirely in the hands of the police, or only permit their exhibition in certain recognised places, as at the Paris Morgue, for instance, than to scatter such pictures broadcast. The police have no difficulty in keeping to themselves such publications as the *Hue and Cry* and other professional documents, and, therefore, no difficulty need be anticipated in keeping such photographs as we speak of also in their hands.

Balloons at the North Pole.—The return of Captain Nares and his gallant companions from the Arctic Seas seemed to have added new zest to the discussion as to how to reach the North Pole, and one is not surprised to hear the question of ballooning cropping up again. Mr. Coxwell is of opinion, it seems, that the navigation of a balloon in those northern regions is possible, but not under the usual conditions; and Mr J. Glaisher, F.R.S., the president of the Photographic Society, one of the most experienced of aerial navigators, looks upon the employment of a balloon, we know, in this connection, as a very likely means indeed of solving the problem. He has himself been able to see and inspect land and ocean at a distance of four hundred miles from an altitude, and the natural inference is that a balloon equipment pushed up to the point reached by Captain Markham and Commander Parr would have been instrumental in permitting those explorers to see what the North Pole was like. There would be no need even to rely upon the report of ocular observations of the half-perished occupants of the car, for instantaneous photographs taken from properly adjusted cameras would suffice to satisfy the most bigoted of those who believe in an open Polar sea and a warm climate in the most northern latitude. But how to get a balloon filled at the most northerly point reached by the sledges is another matter, and one that would require very grave consideration. Whether it were filled with coal gas or hydrogen, a large amount of heavy apparatus and stores would be requisite. Coal is said to have been found in the neigbourhood of the winter quarters of the *Discovery*, and, therefore, there might not be much difficulty in obtaining sufficient for ballooning purposes, but some large retorts and gas holders would be a *sine qua non* under the circumstances. However, in sight of the many obstacles that have to be overcome, perhaps the transport of this apparatus might not be considered so difficult, after all.

Photographic Literature.—The number of photographic journals now published reaches one over a quarter of a hundred, and of these no less than ten, it appears, are printed in the English language. Next comes the German, in which tongue seven journals appear; French, of which there are five; Dutch two, and Denmark and Italy have each of them one photographic journal apiece. When we say that ten journals are published in Anglo-Saxon, our readers must not imagine that they are all published in this country. On the contrary, Great Britain has but the credit of maintaining three photographic periodicals, two of a weekly character, and one appearing every month during the session of the Photographic Society in London. The other seven are: the *Journal of the Bengal Photographic Society*, and *Indian Journal of Photography*, which are published respectively at Calcutta and Allahabad; and five American periodicals: *Humphrey's Journal*, *Philadelphia Photographer*, *Anthony's Photographic Bulletin*, *Photographic Times*, and *Western Photographic News*. In Germany, as we have said, there are at present seven journals appearing; of these one is published at Berlin, the *Photographische Mittheilungen*; two in Vienna, the *Correspondenz* and *Notizen*; one in Elberfeld, the *Archiv*; one in Weimar, the *Wochenblatt*; one in Munich, the *Anzeiger*; and the *Photographischen Monatsblatter*, which is the organ of the Frankfort Society, and of the recently established society at Cologne. Of the photographic journals in the French language, three are published in France, and two in Belgium. The former are: the *Bulletin de la Societe Francaise*, the *Moniteur*, and the *Bulletin de la Societe de Toulouse*. The two Belgian periodicals are the *Bulletin Belge* and *Bulletin de l'Association Belge*. Holland, which has recently attained to the dignity of two journals, both of which are published at Amsterdam, gives to them the titles of *De Navorsches op de Gebied der Photographie*, and *Tijdschrift voer Photographie*. The Italian journal, as most of our readers know very well, is called the *Rivista Fotografica*, which is published at Brindisi; and the Danish organ is styled *Fotographiske Meddalelser*. The German journals *Licht* and *Helios*, which used to appear at Berlin and Dresden, have been defunct for some years.

The Use of the Magnifier in Inspecting Photographs.—When will people begin to learn that it is not necessary to have a powerful magnifier in one's hand to examine a photograph? If you show a man an enlargement, may be larger than life-size, the chances are he will at once dive his hand into his breastpocket, bring out a small enlarging glass, and at once proceed to examine the picture with his nose almost touching it. There were few large pictures this year at the Exhibition, but whether they were large or small, most of the visitors were to be found with their faces not an inch from the glass studying the photographic qualities of the productions. People never look at paintings in this way: why should they treat photographs in such a manner? Many photographers have learnt by experience, and when they hang up a bold enlargement, wisely put it out of the reach of the public, and thus render such close examination impossible. The visitor may at first be a little put out by such measures, and look about him for a pair of steps or a chair wherewith to mount to his favourite position of criticism, or may search in his pocket for opera-glass or tube-lens; but in the end he has to be satisfied to regard the photograph from the standpoint intended, and he is then generally delighted with it. "Nothing like those coarse things you usually see," he will be heard to say; and probably he notes the name of the photographer, and makes a mental memorandum, so as not to forget the photographer who has taken the best picture he has ever seen.

TESTING EMULSIONS FOR EXCESS OF SILVER.

BY SIGMUND SINGER.*

First Plan.—The first substance I tried for this purpose was the cyanide of potassium. To use it proceed as follows: To a given quantity of bromized collodion, made by any of the numerous existing formulæ (but if any acid is given in the formulæ it should be omitted) add enough of an alcoholic solution of pure nitrate of silver, until it is indicated by my silver test that all the bromides are converted, and a silver excess shown.

My Silver Test

Is simply a solution of bichromate of potash in water. The use of it is as follows: Drop a little of the emulsion on a glass plate; let it congeal a little, then pour some of the bichromate solution on it. An excess of silver is immediately indicated by a deep blood-red stain, while if there is only a little trace the stain will be deep orange; and if the emulsion does not contain any, the solution will be repelled from the greasy film, or by moving it up and down only stain it a pale lemon-yellow; moreover, the stain of the excess of silver, being insoluble chrom-silver, cannot be washed off; the other can. The alcoholic solution of silver should be added until by the blood-red stain of the test an excess of silver is manifested, and no more. Now drop into the emulsion a dry lump of cyanide of potassium. Without shaking, set the emulsion aside. The cyanide will dispose of the silver in a very short time, and the emulsion will be cleared, according to the temperature, in from six to twenty-four hours. The emulsion should be tried with the test from time to time, and if no silver is indicated by my test a trial-plate should be taken, and if the pictures are too thin or foggy, should be left in contact with the cyanide some time longer, until a clear, vigorous image is obtained. The emulsion should be then decanted from the cyanide. The cyanide will eradicate any fog. Almost any kind of pyroxyline will be ripened by the cyanide, and give good results. The only drawback is its energetic caustic action on the ether and cotton. I only had a chance to use the commercial cyanide, which contains a surplus of carbonate; but I think the use of the pure crystallized would not offer this objection, or the emulsion might be left in contact with the cyanide only a few hours, and then finished by the second method.

Second Method.—The second method is still more simple, and gives excellent results, and will work well alone or in conjunction with the first method. To the emulsion, prepared as in the first method, is added a quantity—an excess does no harm—of perfectly dry (anhydrous) chloride of sodium in coarse grains; leave quiet at the bottom of the vial, and set aside. The chloride of sodium will dispose of the silver in about twelve hours or more, and the emulsion will be at the same time ripened to the creamy state. If a trial-plate is not satisfactory, leave it longer in contact with the salt, or shake it up with it. The whole process of conversion of the silver can be done in a few minutes by shaking vigorously; but I advise to let those substances work quietly through the length of time at the bottom of the vial; because, first, by the slow action of the silver the necessary molecular change in the emulsion is produced; secondly, the product of decomposition of the cyanide, chloride, &c., remains at the bottom, and will little, if any at all, contaminate the emulsion.

The *third method* is similar to the second; it consists in the use of a carbonate. Its use is similar to the chloride of sodium described in the second method. Pure carbonate of lime in excess is added in coarse grains to the emulsion, and proceeded with exactly as in the first and second methods. Probably other carbonates could be used, also other chlorides, and other salts, insoluble in alcohol and ether, and having an affinity for silver. I think the chloride of sodium will, on account of its simplicity and the peculiar generic action of the chloride for producing clear pictures, become immensely popular, while many will succeed with the cyanide who cannot obtain suitable cotton.

Emulsions prepared in this way will hardly contain anything else but pure bromo-silver. They will be very sensitive, and work clear; but if wanted as further security, a trace of a bromide, or, after Newton's plan, a chloride, can be added to them. They can be used without any preservative, more especially if to the bromized collodion a little nitro-glucose be added before sensitizing; but at any rate I recommend the application of my alcoholic organifier, which will be an improvement under all circumstances. With a peculiar alcoholic preservative I have had plates by this emulsion which in five seconds' exposure showed a full detailed clear picture before development, with a rather dense sky, and only needed a little alkali to give the sufficient density.

After having given *suum cuique*, I think I can, without being immodest, claim as my own: 1. The introduction of an alcoholic preservative. 2. The rectification of the emulsion by the introduction of salts insoluble in alcohol and ether, but having an affinity for silver. 3. The indication of a simple test to prove the presence of nitrate of silver in an emulsion.

CUTTING MOUNTS.*

"We will now describe the operation of cutting a small mount. Suppose the order to be as follows:—'Size, twelve inches by fourteen, gold line, and bevel three inches margin.' First, select a suitable piece of board as to thickness and size, and measure it from one of the edges. The size for the outside of the mount, with the margin, will be fifteen by seventeen. Trim the board with the cardboard cutting machine or a knife to the marked size, and let the outside edges be square. Then mark the size of the mount in the centre of the squared board; this you can do by marking three inches of the margin from two sides with a T square, and the margin will be found correct on the two other sides when the lines are drawn. Having the sides lightly marked with pencil, take the straightedge (or some would use a stout piece of cardboard with the bevel evenly cut) and place the edge a little distance from the mark on the board, and holding the knife as before described, enter it at the point farthest from you, and make a firm cut inwards; turn the board round and cut each side in the same way, care being taken to go well up into the corners, or the corners will not be clean out. If well and evenly cut, the piece cut out will be found to have the light pencil mark round its edge, the cut bevel thus giving the exact size required.

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* *Philadelphia Photographer.*

* Continued from page 569.

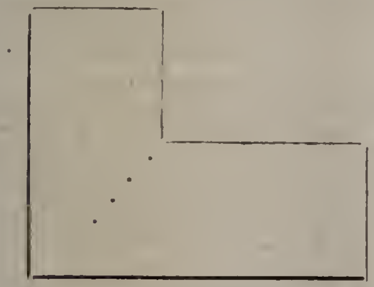
"If the board is thick, it is likely it will not be cut through at the first cut.

"Where a large number of mounts are cut, a piece of plate glass is used to work on, and if this is not used, care must be taken to have a perfectly level surface for the knife to travel over, or you will not produce good work.

"If the bevel edge, when cut, should happen to be rough or frayed, it may be rectified sometimes by judiciously using the knife in one or other direction. It is scarcely necessary to mention that the knife should be kept with a good edge on it.

"Our mount is to have a gold line and bevel. The bevel is covered with gold paper, and this little operation has been thought very difficult by some, but it is very simple. Take a sheet of gold paper and cover the back of it with thin French glue, being careful no dust or grit is in it, and hang up the sheet to dry. When dry, with the straightedge cut the sheet up into strips about the eighth of an inch broad. Next pass over the tongue four strips, or enough of the gold paper for the mount, when the contact of the glue with the tongue will have moistened it, and it will be sticky and pliable. Now take the mount and lay it down on the board before you, and with a strip of gold in the left hand, commence at the right hand corner of the mount, and lay the strip close up, letting the edge of it be just covering the turn of the bevel, when about an inch is laid by the left hand, a clean duster once round the first finger of the right hand passed over the short piece laid in its place will secure it, and in like manner till you get to the end of the bevel, when a small scissors is used to cut the strip exactly to fit the corner. It will now be found that one half of the gold strip is secured to the mount, and the other half is sticking to the board; carefully disengage the paper from the board by rising the mount, and pass the tongue quickly over the glue again, and with the finger of the right hand, as before, rub it down carefully over the sight edge of the mount, and rub it down at the back. The other three sides must then be covered in the same way. The gold bevel of this mount could be laid by a girl in a few minutes.

"The gold line must next be put in, and is very quickly and neatly done as follows. The workman has a piece of cardboard cut out in the following shape, and across the angle there are several point holes.



"This piece of cardboard is placed evenly on one corner of the mount, and with a point lightly mark in one of the holes according to the distance the line is required from the sight edge; the other three corners are marked in the same way. The ruling pen is filled with gold ink made from bronze powder, and the steel straightedge laid from one marked point to the other, and the line ruled evenly; when the other three sides are ruled in the same way the mount is complete. If a gold line is required round an oval mount, a ruling pen put into a pair of compasses will rule a line with the other leg being used as a guide on the sight edge.

"A mount cutter has a large variety of different shapes and sizes of mount, and it is very seldom he requires to mark out the size of a mount, as, if a number of one size is ordered, he will place a pattern mount on the cardboard, which is ready cut to the size, and proceed at once to cut the number required, without marking. Where there is no pattern the exact size, it would be better to mark out the size.

"Where an oval is required, and you have a lot of pattern sizes, by drawing two straight lines for the length and width required, a pattern oval placed over the lines, and one quarter marked at a time, shifting the pattern to suit the size, will be found a ready method. Where there are no patterns, an oval can be well drawn with a pencil, two pins, and a loop formed of thread. If you wish to draw an oval fifteen by twelve, place the pins nine inches apart on the cardboard, and place over them a loop of twelve inches; and, on using the pencil in an upright position in the loop, you will find the correct size has neatly been drawn. An oval can be struck by compasses, by drawing the long diameter, and from the centre set off two-thirds of the difference of the two diameters right and left. This will give the centre for the ellipse, and where the two centres meet will form the centre to draw the ellipse on each side. Round corners, dome, Gothic, and other shapes are easily drawn from patterns."

FURTHER PARTICULARS OF THE LEAD INTENSIFYING PROCESS.

BY DR. J. M. EDER AND CAPT. V. TOTH.*

After the negative has remained in the lead bath for a few minutes, and has become sufficiently dense, it is taken out and thoroughly rinsed in water. We usually put it into water for a period varying from half an hour to two hours after it has been thoroughly rinsed, in order to be quite sure that all the lead solution has been removed from the surface of the plate; finally the image is rinsed again, and treated according to one or other of the following methods with sulphide of ammonium or chromate of potash.

No doubt the ferro-cyanide of silver is not absolutely insoluble in water, as may be inferred from the foregoing statements, for if a white negative that has been intensified with lead is put for a considerable period in pure water, it becomes materially weaker, and cannot be made any denser even if put for some days in a lead bath; there is now no more metallic silver in the picture to serve for strengthening the image any more.

To blacken (sulphurise) the washed white image of lead, we employ exclusively sulphide of ammonium, which acts more evenly and penetrates the film more quickly than liver of sulphur in solution; the latter is very apt to produce spots when employed in the form of a dilute solution, which is never the case with sulphide of ammonium.

Another difficulty, which is not so easy to get over as the previous one, has puzzled many a photographer. It is the liability of many collodions to tear after the process of intensifying with lead, whether while still moist, or dry. This defect never troubled us till lately. On being questioned about it by correspondents, we took occasion to test a large number of collodions, in order to find one in which this difficulty was to be met with. In the experience of many the difficulty never arises, but in one case a photographer has ascribed this tearing of the film to intensifying with lead.

Collodions, we have found, which are prepared with celloidin wool, and with various proportions of ether and alcohol, gave films which never showed signs of tearing, even when we added four volumes per cent. of distilled water (the normal collodion having been produced with 95 per cent. of alcohol). We desired to find out in this way whether richness in water was not the cause of tearing in the film. When by reason of large additions of water to the collodion the film did give fissures, these could not be attributed to the lead intensifier, neither were they rendered more apparent by treatment with this preparation. Kleffel's collodion we found to be free from such defects, and the same may be said of Ubricht's and Kader's Elizabeth collodion, Kreidel's, Dr Heid's, and Moll's collodions. On the other hand, films produced by means of Herzog's brilliant collodion were particularly prone to tearing on application of the lead intensifier; most of the negatives became full of fissures as soon as the film was washed, after taking it from the lead bath, not at once, but when the greater part of the salt had been washed out. The stream of water had also some influence, and when it was strong and cold the fissures were more frequent than when the washing took place with warmer water and in a bath. The negatives also showed a tendency to leave the glass, especially those consisting of chromate of lead (not so much the sulphide of lead films), a defect which was not apparent in the other above-named collodions. This behaviour seems to be due to the circumstance that some collodions, by reason of the manner in which the pyroxiline is prepared, yield opaque and rotten films; they are not then in a position to hold fast the precipitate, and the collodion tears on the slightest contraction, the layer of precipitate itself being brittle and inflexible. It is needless to remark that this opinion of ours is by no means to be regarded as a definite one; but we cite it to show how we have endeavoured to assure ourselves of results in carrying on our investigation.

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* Continued from page 573.

A very good remedy, although scarcely an infallible one, against the tearing of the film, is the preliminary coating of the plates with albumen or rubber solution; in the case, however, of the collodions of which mention was made above, such a precautionary measure is altogether unnecessary. An addition of one per cent. of resin to the collodion is also good. The most simple and most certain method to secure faultless negatives by means of such collodion is, however, after fixing and washing, to bring the plate, while still moist, into the lead bath, and to let it dry as it comes out of the lead bath. The intensifying takes a long time, but the films do not then tear on drying.

How to Clear up a Negative Intensified with Lead.—Any symptom of fog that may be produced upon a negative after treatment with the lead solution may be removed, but it must be done before the image has been blackened, and after the film has been thoroughly washed. The most radical medium to employ in order to weaken the negative is hyposulphite of soda. This salt, if employed in a solution as strong as that usually made use of in fixing, would at once dissolve away the perfectly white image, and leave nothing but the film of collodion behind. Ferrocyanide of silver, as also ferrocyanide of lead, of which the picture is composed, are easily soluble in hyposulphite of soda solution of the strength (1 : 4) generally employed for fixing. Such a concentrated solution is therefore altogether too energetic for clarifying an image of this kind, and could not be controlled. Dilute solutions (about 1 : 20) answer the purpose admirably, however, and many a fogged negative may be saved by their use.

Cyanide of potassium only makes a negative lighter and thinner up to a certain degree; it will not go beyond a certain point, but may nevertheless be employed for our purpose. By means of cyanide of potassium only ferrocyanide of silver is dissolved, and the ferrocyanide of lead is transformed into cyanide of lead, which is soluble in an excess of cyanide of potassium.

The carbonates of soda and potash have also the effect of making the white lead pictures thinner. Caustic soda has also the same effect. Tartrate of ammonia dissolves ferrocyanide of lead.

As regards the behaviour of the lead image in the presence of other reagents, we shall give further details.

(*To be continued.*)

DEFECTS IN CARBON PRINTING, AND THEIR CAUSE.

BY DR. PAUL LIESEGANG.*

In sensitizing the tissue, the black pigment flows from the paper backing in streaks.

This is due to the chromate bath being too warm.

In drying the tissue the same defect arises.

To prevent this, the tissue should be squeezed on a glass or a zinc plate by means of a squeegee; or the tissue may be dried in a cooler place.

On removal from the glass, dust or fibres are found upon the image.

In this case the plate was not clean; a piece of rubber cloth should always be laid upon the tissue before the squeegee is applied, and this prevents the formation of fibres.

In printing the tissue does not lie flat upon the negative.

It has been too rapidly dried, and must absorb moisture again in order to become supple.

The tissue sticks to the negative.

The tissue is too moist, or the negative or pad is damp. Very hygroscopic tissue may be improved by coating with normal collodion. The collodion must be allowed to dry perfectly. Tissue kept in a damp place absorbs moisture. If the printing frames are damp, a piece of oiled or waxed paper will protect the tissue; but it is better to employ frames with evenly planed lids covered with cloth. This prevents certain portions of a picture from being unsharp, by reason of the tissue being hard and brittle.

The wax on the glass plate will not polish.

The plate is either too cold, or else the wax is impure and the rag damp.

On applying the moistened and printed tissue to the plate, air-bubbles are formed which are visible through the glass.

The paper must be left somewhat longer in the water, and applied with more care. By the use of the squeegee it is impossible to get rid of small air-bubbles; it is better to pull off the tissue again, and rinse it once more in the water.

The tissue will not adhere to the plate, the corners lifting from the surface.

It has remained too long in the water, or has been printed too much, or has deteriorated by being kept too long. In the first case, the tissue is kept down by letting a glass plate and a weight of some kind remain five minutes or longer upon it. To ascertain rapidly whether the tissue is still serviceable, a piece should be put into warm water, and if the whole readily dissolves, it is fit for printing. If, however, the tissue repels the water, then it has become unfit for use from drying too much or absorbing foul air. Freshly sensitized tissues do not show any of these defects.

The tissue will not dissolve on development, or does so with exceeding difficulty, or the picture will not wash out perfectly, and remains too dark.

Too long printing or too long standing before development is the cause of this; hotter water, or a bath containing two per cent. of carbonate of soda, may help matters; if not, the tissue is spoilt.

The tissue dissolves too rapidly, and the images are too light.

The printing has been insufficient; the development should be undertaken with colder water.

On dipping into warm water, air-bubbles are formed on the back of the tissue.

The water is too warm. At the beginning cold or lukewarm water should be taken, and the temperature afterwards raised, or the pictures should be first dipped in cold and then in warm water. The bubbles often mark the pictures.

The image swims off at the corners, while the collodion remains.

The safe edge has been forgotten, or the tissue is bad.

The image and collodion both swim away.

The wax employed on the plate contains tallow, or the collodion had become too dry before it has been dipped in the water.

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* From *Der Kohle Druck*.

The collodion film tears.

It is rotten or too fresh. The addition of negative varnish is desirable, or the collodion film is not perfect. The edges of the plate should be rubbed with a corrundum file.

Between image and plate are particles of dust or film to be found.

If these were not on the plate in the first instance, they come from the water.

Bubbles between picture and plate or developing paper.

The paper was not applied with care, or not sufficiently squeezed. The operation of squeegeeing should be commenced from the middle of the paper, and not from the edges.

Numerous little fissures in the image.

The tissue has remained too long in the chromate bath, or the latter was too strong or too warm.

The film is granular on covered with network markings.

The tissue has not been long enough in contact with the developing surface. Tissue which after sensitizing has been subjected to injurious vapours often show this defect; also tissue that has been too rapidly dried.

Swelling of the image on immersion in water, or formation of moss-like growth in tissue.

Due to paper rendered unserviceable by the absorption of injurious vapours or other means.

Network formation upon the image on development upon glass.

The printed tissue has not remained long enough in cold water; I have proved that it is by no means so necessary to apply the printed tissue to the zinc plate after the former has been immersed in cold water; it is advisable that the gelatine should be thoroughly saturated with water before it is applied to the plate.

Small bright spots or bubbles in the image.

These are due to the same cause. They are formed a few minutes after the tissue has been applied to the glass plate, between the collodion and the tissue, and cannot be got rid of with the squeegee.

Clouds, especially in the background.

These may be got rid of by manipulation with hot water; they are caused by the circumstance that the whole of the ether and alcohol was not evaporated from the collodion when the tissue was applied.

Half-tones in the lights of the picture fail.

The negative is too dense; the sensitive tissue should be exposed to daylight for a short time before or after its sojourn in the printing-frame; or the tissue has been too rapidly dried, and hence it is too soluble.

On transferring, the picture will not come away, or does only partially.

The plate is not sufficiently waxed, or there has been too much resin mixed with the wax solution. Or the wax has been rubbed off the plate entirely; or, finally, the transfer paper has been dried at too high a temperature.

The transfer paper comes away without the image.

The paper has been dipped into water of too high a temperature, which has dissolved away the gelatine; or the picture has been too long in the alum bath.

The image is full of shining spots, mostly in the high-lights.

The water into which the transfer paper has been dipped was not hot enough.

The picture is mealy.

This is due to it remaining wet too long a time before transfer.

SOME RAMBLING THOUGHTS ON LIGHTING.

BY F. M. SPENCER.*

It is not my purpose to lay down any fixed rules for lighting the sitter, for I think there are none that will be applicable, since every light differs materially from every other, and each subject requires some modification of light. Also the manner of treatment of the sitter differs under the same light by reason of the variety of ways different artists will treat the same subject, giving a personality to the picture peculiarly his own; but there are some points having a common bearing that might be well to observe. In a general sense the lighting ought to be the same as it is desired to appear in the picture, but the shortcomings of chemical action make certain modifications necessary, owing to the photometry of colours, as, for instance, some light shades of hair photograph too dark, and an allowance of light, and, after a judicious use of powder, may be necessary to give the proper chemical balance. The same may be said in regard to draperies (except the powder). For white or very light draperies the light should be so subdued that the shadow lines may be retained in development; a shadow so strongly lighted as to come up stronger than the high-lights of the face will be sure to flatten and spoil the picture. The direction of light should be such as to give well defined lines of light and shadow, say toplight at an angle of about forty-five degrees, and side-light at a somewhat lower angle, so as to break up abruptness, but not so as to destroy solidity. Direction of light should be not only apparent, but well defined in every picture. Never let the light flow directly over the camera to the sitter. Suppose the downward flow of light to be at an angle of forty-five degrees, it should cross the line from the camera at a considerable angle, say twenty to seventy degrees.

Except for full-length figures, the lower half of the side-light should be very sparingly used; or, in other words, the side-light and top-light should join so as to produce one solid light, one general direction of light, and to soften the shadow side, a folding screen of about 18-inch panels or sections, painted in some light neutral tint, will be found very useful. Avoid too broad high-lights; in fact, they should be used sparingly, middle tints freely, and every high-light should be balanced by a corresponding shadow, with the understanding that the shadows admit much greater breadth than the lights, and intervening middle tones should so melt into both lights and shadows as to destroy all abruptness of either, and produce a harmonious whole. A broad light, and a broad solid shadow, are alike distasteful, and a blank space in the picture; the high-light should be round, and shadows transparent. Should you experience trouble in getting a sharp, clear focus, be sure there is some offensive "cross" light that needs cutting off; for a well-lighted subject will give a clear, sharp image on the screen, one that can be readily and quickly focussed. A head-screen will be found to be frequently serviceable.

It is not necessary to sacrifice any good quality of a picture in order to secure another, as sharpness to secure softness. Such things are only tricks, contemptible in their meanness.

The external lines can only be spoiled by bad posing and bungling management of the background; but in the internal lines all the modulation should be preserved in the lighting, and faithfully brought out in the negative. The reputation of the artist and pocket of the proprietor demand that as little "modelling" be left to the retoucher as possible. Except for very small children, let the question of time of exposure be of minor moment; that of *effect* the supreme object to be attained. Always determine just as you want the finished picture to look before you begin, and work faithfully to that end, and the result will be equal to your powers of conception, or at least only curtailed by the faults of chemical action and optical imperfections. Let your light so shine that the camera, seeing your good works, shall let others know the mind of the master.

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* *Philadelphia Photographer.*

The Photographic News.

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COMPETITION IN PRICE INSTEAD OF IN QUALITY.

A correspondent writes, enclosing us the advertisement of a photographer in his neighbourhood, who, in magniloquent style, proclaims his own discovery of a new and improved process in photography, which enables him to produce better portraits at a cheaper rate than any of his competitors. Subjoined to the announcement is a list of very low prices, not only offering a dozen "carte-de-visite portraits finished in the Parisian style" for five shillings, but also offering a sitting and one example as a specimen for one shilling! Our correspondent thinks it our duty to "expose" such cases, and thinks that if we "held up by name all who undermine the profession to public obloquy," we should perform a good service which would have a deterrent effect, and check unfair cutting in prices. Our correspondent will, on a little reflection, see that he mistakes our duty. We have no right whatever, either to try, pass judgment, or undertake execution on the culprits. We were quite prepared to join with our correspondent in regretting the unfair competition which degrades the art, and were about to add that such a course generally brings its own punishment, by ending in commercial failure, as, in the long run, unfairly low prices cannot pay. But as we glance again for a moment at our correspondent's letter, we find he adds:—"The worst of the case is, that working at such prices manifestly pays, and Mr. —— appears to be very successful. A few years ago he came into the town, and began in a humble way. He has just gone into very large premises, which, I am told, he has bought, and he makes a display which attracts the whole town, whilst other artists long settled in the town, who struggle to maintain the dignity of the art, are barely making a living."

There is something very pathetic in the picture just drawn; but our readers will see at once that it is in no wise essentially a matter confined to photography. It is not in any special way a matter of prices. This shrewd, energetic business man would probably have secured the same success in many trades; he might possibly have done so without cheaper rates. But his primary aim is to arrest public attention, and, by hook or crook, get the public to visit him. It is not probable that he will make a fortune by taking a negative and supplying a print for a shilling; for few will visit his establishment and find it easy to leave without the expenditure of more than a shilling. In every profession the modest, orthodox, self-respecting practitioner is at all times passed in the race by the less capable but more enterprizing, or, sometimes, more impudent, adventurer. But nothing is more fatal, as a rule, than any attempt at competition in prices. If the modest, careful, conscientious worker attempt this, he is in most cases ruined. That kind of competition is not his *metier*, and he can neither succeed in it nor be happy in it. Reducing his prices may lessen his income and lower his self-respect, but it will not materially increase his business, or serve him in any way.

Regarding the general question of prices, it is difficult to speak. Any fixed scale of prices for a given size must be unjust in its operation, as degrees of excellence are so varied. The right of every man is undoubtedly to fix his own prices; but, as a simple matter as well of self-interest as of justice to the public and the art, we strongly urge photographers not to be tempted by the spirit of enterprize and competition into working for too low prices. Good work, artistic work, permanent work, cannot be done at low rates. The term "nasty" must, as a rule, be allied to the word "cheap," or, more accurately, "low-priced." The tendency of competition to produce lower prices instead of better work is chargeable, we have no doubt, with much of the instability which has become the abiding reproach of photography. It is not confined to this country. In a recent number of our Philadelphia contemporary, we find a correspondent bewailing a similar state of things. He enclosed a card just issued by a high-class house announcing very low prices, and this card he thinks an insult to all respectable photographers. Here is the card in question:—

"Card.—The prices charged in New York for the prevailing styles of first-class portrait photographs, known as Imperial cards and cartes-de-visite, although established by me years ago, do now, in my opinion, unnecessarily restrict the business. While the highest artistic standard will continue to be maintained at this establishment, common sense business principles need not be ignored. I propose to lead in placing the high art of photography on a square business basis of reasonable prices and profits, and, therefore, offer to the public a quality of pictures such as shall not be surpassed in this country, at the following rates:—

"Imperial cards $6 per doz., 2 doz. for $10
"Cartes-de-visite $3 per doz., 2 doz. for $5
"(Established 1859.) "Photographer,
"*Broadway, N.Y.*"

We may remark, in passing, that in this country three dollars would not be regarded as excessively low for a dozen cards. Three dollars would be equivalent to twelve shillings and sixpence, if the rate of exchange were at par, but as the matter stands, it brings the price a trifle lower than that sum. But the prices of both the necessaries and the refinements of life are dearer generally in the States than in this country. To return to the correspondent of our contemporary, who comments on this card, he ejaculates:—

"'The highest artistic standard,' 'I propose to lead in placing the high art of photography on a square business basis,' 'pictures such as shall not be surpassed in this country,' &c.

"And all of the above for 'three dollars per dozen.' Is the man mad? or does he think the people fools? The postal card with the above on was handed to me by a professional man, a lover of art other than the art photographic, and right heartily did he laugh. I had finished making a sitting of him for an Imperial photograph. He is one of those hard cases that we meet with so often in photography, very angular features, &c. I was fully an hour holding him in conversation, with no other object than to study his face, and how I could best make his position. The upshot was a good negative the first time, with as much art composition in it as I was capable of. Now, will Mr. R. or somebody else tell me how much 'high art of photography' can be executed for 'three dollars per dozen.'

"Mind you, this is from Broadway, New York City, and from an establishment of no small pretensions, under heavy expenses, &c.

"I am almost ashamed of some of our brethren. I have seen specimens of this particular photographer's 'high art,' and those I have seen would readily call forth the ejaculation, 'How is that for high?' leaving off the art as having nothing whatever to do with it. I trust and hope, for his patrons' sake, they were only the very poorest.

"At any rate, I think the issuing of the above card is simply an insult to all true photographic artists, who are using up their life energies to elevate the art, and not degrade it."

FRENCH CORRESPONDENCE.

M. Chardon's Dry Process—Typographical Blocks—M. Despaquis's Claims—Another Photochromic Process—M. Ducos du Hauron's Colour Process—Violet Glass for Studios.

The monthly meeting of the French Photographic Society was held on Friday last, the 1st December. M. Alfred Chardon exhibited a number of carbon prints of a superior character, printed from plates taken by the aid of a dry collodion process, the details of which he had handed to the President in a sealed packet on the occasion of the last meeting of the Society. The process is still maintained a secret, but the specimens we saw the other night convinced us of its excellent character. They were pictures of landscapes and monuments of exceeding delicacy. M. Chardon also exhibited some transparent positives upon glass obtained with plates prepared like the clichés. In submitting these examples to the Society, M. Chardon intimated that he proposed to enter himself for the competition which has been announced, and of which the details have already been communicated to the readers of the Photographic News.

M. Rousselon brought with him a collection of prints recently produced at the works of MM. Goupil et Cie, among which are some very curious specimens. First of all, there was a block engraved by photography, not in *intaglio*, like those hitherto shown, but in *relief*, like a wood block. It is now some years since M. Rousselon first began these experiments to obtain printing blocks which could be employed in the type press, and printed with ordinary letterpress, and in the case of illustrated journals Already in 1872, the *Moniteur de la Photographie* was enabled to publish a plate of this kind, which the skilful director of the photographic works at Asnières had succeeded in producing at that period. It was a view in a forest, and it attracted general attention. Since that time M. Rousselon has continued his experiments without attaining any greater perfection. The block which he exhibited the other evening at the Society's rooms is a reproduction of a monument from nature, like that of which we have just spoken. The image is seen in all its details, but it lacks vigour, and if it exhibits half-tones, there is not sufficient contrast to raise its appearance above a grey monotonous aspect. It is here, as our readers know, wherein the great difficulty lies. In order that a block may be printed in a printing press, it is necessary that it should possess hollows and projections much more pronounced than in the case of a copper-plate engraving. In the one case the relief gives the blacks of the image, in the other it gives the whites. Now it is easy to understand that the proper degree of depth is only obtained—whether produced by etching or by electrotyping—at the expense of the half-tones. *Apropos* of this process, a circumstance happened at the Society which may be mentioned. When the specimen was brought forward by M. Rousselon, another esteemed member, M. Despaquis, suddenly rose, and stated that the process alluded to by M. Rousselon had been invented by him some time ago. It was pointed out to him that M. Rousselon had simply exhibited the plate, without stating by what means it had been produced; but, nevertheless, M. Despaquis went on with his protest in a most vehement manner, amid general merriment. Poor M. Despaquis! he passes his life in protesting. It would be better if, instead, he were to carry out some of his ideas, which are often good enough, but which he permits to remain as ideas, or works out very incompletely.

After this little episode, M. Rousselon exhibited to the Society some photographic impressions in colour which had been forwarded to him by a correspondent in Holland, M. Otto Radd, if we caught the name correctly. The process by which the pictures were produced was the invention of M. Grath, who had patented it. It was a purely mechanical one. You begin by tracing upon a smooth surface, of a stable character, an outline of the original object which is to be reproduced, indicating by outlines where the different colours are to come. Then there is placed in each compartment a sort of special ink which contains a greasy substance, coloured to the tone which it is desired to reproduce. This paste or ink has the appearance of soap, and with it is formed a sort of Florentine mosaic about an inch thick, roughly representing the original. On applying and pressing against this cake a sheet of paper prepared with turpentine, which dissolves the surface of the greasy substance it is placed in contact with, an impression in colours is secured. The printing may be continued, of course, until the whole thickness of the cake of greasy pigments has been used up. Upon each of these coloured impressions is then placed a transparant film photograph, and in this way is produced a polychromic reproduction of the original object. Some of the members present compared the results with those given by the photochromic process of M. Leon Vidal. Although the comparison as regards the fineness and delicacy of the details produced was vastly in favour of the latter, at the same time the process brought forward by M. Rousselon might well be employed in the production of ornaments upon stuffs and fabrics.

The meeting terminated with a practical description by M. Klerjot of the process of M. Ducos du Hauron, with which the readers of the Photographic News have been acquainted for some years past. M. Klerjot repeated before the Society all the operations which had been described by the author in the different memoirs that he has published. The demonstration—which was, by the way, very interesting—proved once more what a clever and ingenious experimenter M. Ducos really is; but, at the same time, it confirmed the idea which has hitherto been impressed upon most of us, that the process has not yet arrived at a sufficiently practical stage to permit of its being worked industrially. The pictures which the process furnishes, while very curious in their way, are only so-so, and require still to be much improved.

Many members spoke during the meeting of the new mode of lighting studios proposed at the last meeting by M. Scotellari. Everybody concurred in the belief that light passing through violet glass must be more efficacious than ordinary light, and they await with impatience the establishment of the experimental studio, in order to make practical trial of the subject. In respect to this question, we may mention the circumstance that we have just received from M. Terpereau, the eminent Bordeaux photographer, a letter in which he says that, having tried the process of M. Scotellari by the aid of violet curtains, he is able to vouch for the time of exposure being very much shortened thereby; only he found it more difficult to judge of the effect of light and shade upon his models. M. Scotellari, to whom we have communicated this, tells us that the inconvenience, if it exist with curtains, ceases at once on recourse being had to violet glass, which is so very transparent. Such an explanation appears to us to be probably the true one. Ernest Lacan.

PHOTO-ENAMELS.

[On the occasion of the presentation of some coloured enamels to the National Academy of Paris by MM. Gougenheim et Forest, whose works have already been mentioned in these columns, the President of the Committee of Fine Arts, M. de la Blanchère, took occasion to speak of their merits. We have translated M. de la Blanchère's speech as fully as possible, and now place it before our readers very nearly as it was delivered.]

A very natural propensity of man, when he possesses anything good, is to wish for something better. At first he is surprised and enraptured with the results of photography, and then he is angered over their fragility; while regarding the *chefs d'œuvre* that are produced, he regrets to see them fade away, and disappear. For this reason he has attempted to render the fugitive image unalterable, and capable of resisting the ravages of time in the same degree as other works of art executed by his hands. In this he has now succeeded, but in face of great efforts. It is a curious history of labour without relaxation, and always progressive.

The photographic image upon a silver plate, fixed and amalgamated with gold, acquires comparatively durable properties; we have already proof of this in the fact that many such pictures have lasted for a third of a century, and will in all likelihood last many years longer. Unfortunately, the image is fragile; clumsy handling on rubbing suffices to remove it, and it can only be seen in a certain light. For this reason the Daguerreotype was abandoned.

The pictures upon paper which succeeded are not only easily spoilt by reason of their support, but are, alas! unstable and fugitive, because of the relations of chemical bodies which are generated. Many experiments have, therefore, been led to be made. Painting with oil upon an image transferred to canvas has been tried, and chemical reactions resorted to other than those of the salts of silver which leave images formed of inert bodies—in carbon, for instance. Again, we have photo-lithography, helio engraving upon metal, Woodburytype, &c., all plans based upon the assimilation of photographic engravings to the ancient plates formed with greasy ink. Finally, we have a method of securing inalterability of the image by its incrustation in an inert support, such as porcelain or clay of some kind; and further, to say a last word on the subject, permanence secured by burying the image in enamel upon copper.

The incorporation of a black photographic print in a fusible layer of white enamel deposited on the surface of a sheet of red copper is an operation which demands much experience and considerable manipulative skill, but which does not actually constitute art unless pigments enter into the question. In the case of coloured enamels, we have art. The hand of the artist certainly intervenes here, and if these productions in colour are put among retouched work, they have the highest value and qualities. We do not fear to say outright, and once for all, that it is a false point of true honour which induces certain photographers to interdict the work of the artist upon that which light has produced. What does it matter in the end, so long as the image produced is an artistic and true likeness? I know that at the beginning artists were so unskilled in the delicate operation of retouching that they altered materially the original photograph; but little by little they have improved, and, artists aiding in the matter, they have to-day arrived at a point at which their work is a benefit.

In a carte-de-visite, may be, their intervention is often not required, for a carte is decidedly an ephemeral production. It vanishes, is lost, fades, or is carried away with other flotson and jetsam in this world. But an enamel is not a work of this kind; it is a permanent souvenir which will remain for centuries without losing for one instant its freshness. Such a work as this merits the intervention of the artist.

But, it will be asked, by what miracle of prestidigitation is it possible to cover that curved and rigid plate of enamel with a photographic print? The public, in a great degree, confound these with glazed pictures produced upon paper covered with gelatine, and which are sold under the name of enamelled photographs, and for this reason we are about to say a few words on the production of true photographs on enamel.

The commencement of the process does not differ materially from that of the ordinary photographic methods. It has as a basis a negative image upon collodion. This serves for the preparation of a counter-print or positive, also upon collodion, by the aid of which you produce a proof upon bichromate of potash in gelatine. Then, by means of an impalpable and fusible powder, and by the aid of an intelligent brush, you produce upon the gelatine-covered plate the image endowed with that fineness which we need. This first phase of the operation permits us to secure photographs of all colours, but monochromes; and it must be remarked that we are still acting "by machinery," if we may so express ourselves, for the hand of man has not yet intervened to produce those contrasts of colour and of light and shade which constitute an artistic painting.

We now take our image of coloured powder upon the medium of the collodion film, and we transfer the whole to a plate of red copper, which, as we have said, is covered with a layer of white enamel. It is now our object to destroy and remove the pellicle of collodion, and to fix the image by means of fire, so that it may remain intact upon the enamel. This is one of the most extraordinary operations, and also one of those which require the most skill and experience.

This burning in the furnace may be described as the critical part of the whole work. The opération is anything but an easy one. It is necessary to manipulate with judgment a most terrible element, and it is wonderful to follow with the eye, in the white heat of the muffle furnace, the progress of the little cliche, which presently melts and becomes glazed, and which must be withdrawn at the proper moment, under pain of its being in one moment completely lost. Nothing is so curious as to watch the transformation that comes about at this terrible temperature of 1,500° or 2,000° centigrade. The little plate of copper that supports the cliche becomes red, as also does the enamel, which, however, soon changes to a white heat; and when the latter is withdrawn, the image first of all appears vermilion, then of a cherry red, and then the blacks assume a more intense tone, while the whites become pale. The image presents an admirable contrast, and very often beginners are deceived by this first fleeting effect. But the image now begins to cool, and the cooler it becomes the greyer are its tones. One must be very careful to arrest the process at the right time. Neither too long nor too short must be the sojourn in the muffle furnace.

It is, however, quite another thing when it becomes a question of burning a coloured enamel. In this case, on its exit from the furnace, it becomes all sorts of colours. It passes from yellow to red, fogs, and becomes indistinct, as if it is going to fail altogether. But no, one tint after another cools; as many colours as there are, as many times must the enamel enter the furnance, so that the risks run by the operation are multiplied infinitely. Sometimes four, five, and six times is the enamel fired, and the least accident may lead to a total destruction of the whole picture, when, of course, the only alternative is to begin again from the commencement.

It is now no longer a question of chemistry or mechanics; it is artistic taste and professional skill that can alone help in the matter.

If we were asked to point out the advantages of this method of producing photo-enamels, I must acknowledge that in my eyes they are of such importance that I am astounded these permanent and beautiful pictures are not more commonly employed. When we see, from the rare specimens that still exist of enamels produced centuries ago, and which represent the most beautiful examples of decorative art, and we also learn with what facility enamels may be produced now-a-days by photography, it seems strange, indeed, that productions of such high artistic value are so rarely seen. When perfection has been reached in the production of works of art, landscapes, scenes, pictures of all kinds, there will be no end to the resources at one's disposal.

One last word to show the unlimited applications of which photo-enamelling is capable. We have seen one after another colours fixed according to will in the unalterable film, and in the same way it is possible to fix also by means of the muffle furnace gold and silver upon enamel, which may be burnished afterwards. It is possible, therefore, to produce portraits whose brilliancy recals that of medallions; nay, more, and what is more artistic, you may employ all the fantastics of imagination in arabesques and in ornaments for the decoration of enamel surfaces. It is only necessary to have recourse to gold and silver reduced to impalpable powder, and this is then applied by the aid of a brush in the same way precisely as we have described, or, if desired, with a medium of some kind, such as a fatty varnish, for instance. The fire burns away and vaporises the resinous matter, and the metal, penetrating the soft surface, is fixed in the enamel.

We should be glad to say still more upon the subject of this beautiful process, which would lend itself also to the production of admirable glass transparencies or vitrienes. Indeed, we see in this employment of photography numerous and most important applications on the subject of which we hope one day to speak further to the members of the National Academy.

THE THEORY OF PHOTOGRAPHIC PRINTING.[*]

Printing is a comparatively easy matter: it is photography in its oldest and simplest form. Wedgwood and Davy, and others who experimented upon the photographic properties of the salts of silver at the beginning of the present century, did not, so far as is certainly known, attempt anything but printing. They saturated a piece of paper with nitrate of silver and then exposed it to the sun, interposing the opaque body whose image they wished to trace upon the paper. The more modern printing is in principle the same. The negative taken in the camera, and developed and fixed, consists of a deposit of silver upon glass, some portions of which are opaque, and others in a greater or less degree translucent; while other parts, untouched by the sun, and freed by the fixing solution from all the silver salts, are mere bare glass. The process by which a picture is made upon paper with this negative is more like stencilling than any other pictorial operation. The negative is exposed to the sun with a piece of paper, sensitized with chloride of silver, fastened under it. The sun, streaming through the bare glass of the negative, paints in reduced silver the shadows of the picture upon the paper beneath. Acting with less force through the translucent parts of the silver deposit on the negative, he fills in the half-tone of the picture; and leaving untouched those parts which lie under the opaque portions of the negative, he leaves the natural colour of the paper to supply the high lights. When the deposit of metallic silver is complete, the unaltered chloride is removed by hyposulphite of soda, as in the production of the negative. So far the operation is very plain, and the chemical reactions are very simple. But the process, in this crude form, leaves the picture of a very disagreeable colour—much that kind of tawny-red which, when it makes its appearance in mustachioes or beards, is popularly known as "ginger-colour." How far taste in the selection of colour for a monochrome is a matter of habit and convention may be left to theorists to discuss. As a matter of fact, a ginger-coloured photograph would find neither admirers nor purchasers. Photographers, therefore, have been compelled to interrogate chemistry for some new device for making the pictures so wonderfully produced more pleasing to the eye, and the process which the science has supplied to them for that purpose is the most curious and instructive of all. A solution of an unstable salt of gold is taken—the chloride—and it is made more unstable, or rather its decomposition is actually though very slowly commenced, by the addition of a weak alkali. Taken at this point of half-disturbed equilibrium, a very minute additional impulse is sufficient to produce immediate and complete reduction. This impulse is supplied by the attraction which the metallic silver in the print appears to exercise for metallic gold. The print is put into the alkaline solution of chloride of gold. After a few minutes it begins to darken visibly and to alter its colour, and it passes through all the shades of brown and purple successively until, if it is allowed to remain long enough in the solution, it turns inky black. The colouring matter is the gold, which, attracted by the silver in the print, has disengaged itself from the chlorine with which it was combined, and has fastened itself to the silver so firmly that no amount of rubbing can detach it. As the colour of comminuted gold is a purplish black, this tone is consequently given to the print. There are two specially noteworthy points in this remarkable operation. One is, that the gold is attracted to the silver deposit in precisely the proportions in which that deposit is distributed upon the paper, so that the harmony of the picture, all the balance of light and shade and half tone, are faultlessly preserved. The other is, that the gold is not merely attracted to the silver, but actually turns some of it out and takes its place. A number of prints analysed before and after toning are found not only to acquire gold in the operation, but to lose silver. The phenomenon is not easy to explain; but it has been well ascertained, and it must be accepted as another of those illustrations of mysterious chemical laws, hitherto little if at all known, which photography has furnished in so many instances.

The process of photographic printing—or stencilling, as it should rather be called—is beautiful and simple, exquisite in result, and not difficult in manipulation; but it has one fatal defect. The prints which are produced have no guarantee of permanence. A few of those that were made when the process of printing was first discovered, some twenty years ago, have survived uninjured to the present day; but the vast majority, even of those that were printed ten or twelve years back, have lamentably deteriorated and, in some instances, utterly disappeared. The chemical cause is simple enough—so simple as to be quite irremediable. The print is made of silver, and there is silver even in the whites. Wherever silver comes in contact with sulphur or sulphurous acid, sulphide of silver is formed—as under-butlers, who have to keep plate from tarnish in a London atmosphere, know too well. The owner of a valuable photograph may watch the formation of the sulphide of silver when he sees a yellow tinge, like the tint of very ancient wine, creeping over his picture, and confounding first its tones and at last its outlines in a pale dirty yellow fog. It is hardly possible for the print to escape this fatal contact. The hyposulphite of soda, which is used to fix the picture, is expelled from the print only by the most laborious and protracted washing, and even then with the most doubtful success; and the sulphur which it contains is ultimately set free by decomposition to destroy the beauties it helped to form. The white of egg, which is the basis of the print, contains sulphur; and unless the freshness of the eggs can be guaranteed, the sulphur will be anything but inactive. But even if the silver should escape from the dangers lurking in the print itself, there is the sulphur in the air, which is always present where coal or gas is burned, and under many other circumstances besides. It is not surprising that, with all these dangers surrounding them, photographs should be generally credited with a very brief probability of life. Among scientific photographers, opinions are much divided upon the subject; but there have not been wanting high authorities who have declared that the destruction of every silver print is only a question of a few years.

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[*] *Quarterly Review.*

Carbon processes, as they are called, are interesting because of the totally different photographic field which they open. Photography, as we have hitherto spoken of it, turns exclusively upon the sensitiveness to light of certain salts of silver; but silver is not the only substance in creation which is sensitive to light. Among others, some of the compounds of the metal chromium have a similar property. They are partially decomposed by light under certain conditions. If the bichromate of potash or of ammonia be mixed with gelatine, or albumen, or gum, or honey, and then the compound be exposed to light, the bichromate will part with an atom of oxygen to the organic matter with which it is mixed; and the effect of that oxidation will be to make the organic matter insoluble in water. This curious reaction has been applied to the purposes of photographic printing. If a plate or paper be coated with gelatine that has been mixed with a bichromate and with lampblack, and be exposed to light under a negative, the gelatine that lies under the transparent shadows of the negative will become insoluble; that which lies under the half-tones will be partially insoluble; and that which lies under the opaque high lights will remain soluble as before. Plunge the plate, after exposure, into hot water, and the black gelatine will be left insoluble upon the shadows and partially so upon the half-tones, while the high-lights will be washed entirely away, and will be represented upon the picture by the bare paper. Bitumen of Judea possesses the singular property of becoming insoluble in essential oils, if it has been exposed to the light; and of course this peculiarity has been utilized in a similar way. It is but very recently that certain difficulties of manipulation have been sufficiently overcome to enable photographers to take carbon prints with a certainty of success.

(To be continued.)

Correspondence.

HINTS ON PERMANENT CHROMOTYPE PRINTING.

Sir,—After some twenty years' business experience in photography, I ventured into the new trade of carbon, and became a licencse of the Lambertype and Chromotype processes. I took my instruction at the Autotype Company's Works; and getting back to Salisbury began in right earnest to try my hand at the work. It must be confessed that for a few weeks I found many difficulties, and began to feel that I had tackled a troublesome process; with, perhaps, a regret or two that I had not stayed at home, and kept the money in my pocket. However, perseverance changed all that, and beginning to feel I have been as successful with this beautiful process as most of the licensees, I am proud enough to believe my experience may furnish a few useful hints to others, and therefore, Mr. Editor, I venture to write to your journal. Having worked my way through the inexperience, carelessness, and mismangement that beset beginners, my belief now is that chromotype printing is more simple and more certain than silver; that it gives greater brilliancy and finer tone than it is possible to obtain by silver; and that the prints are obtained in less than half the time. Added to this is the important fact that the public appreciate the chromotypes for their beauty and their permanent quality, and I can truthfully say since I have adopted this process I have nearly doubled my business, get a high price for my work, and give the greatest satisfaction. I had but one set of lessons at the Chromotype Works, and although I found the Company very willing to give me information in writing, after the first month I have managed to get along by my own endeavours, and my way of working is this:—

Sensitizing the Tissue.—In the hot weather I use one ounce of bichromate of potash to thirty ounces of water, adding ten drops of ammonia or the Company's sensitizer to thirty of water, and upon the whole preferred it. Now we have come to dull light and cold weather, I employ one ounce of sensitizer to eighteen ounces of water. I sensitize every evening in a bath of this strength so much tissue as is wanted for the next day. I immerse the tissue for about thirty seconds, keeping it always on the move, and pass my hand merely over the surface to remove any dust particles, instead of the sponge recommended by M. Lambert. When sufficiently sensitized, as is shown by the tissue having a tendency to curl upwards, I simply draw it across the edge of the zinc or tin dish, then lay it upon a curved blotting pad, face upwards, to dry. I keep a lamp burning in the room all night, which gives a gentle heat that allows the tissue to dry somewhat slowly, but still to have it quite ready by the morning.

Printing.—On exposing the tissue I use the ordinary tint actinometer with sensitized paper, and after a little practice one need be seldom wrong. It is convenient to make the number of tints required on negative after printing for future use, and I prefer Durand's sensitized paper to any other, and find with proper care it will keep good for a couple of months.

Developing.—Here, I believe, is where many chromotype printers get puzzled, and make the most mishaps. First thing to avoid is not to begin the development with water above 58°; the heat may be increased, as the picture works up, without any harm. The grooved tank recommended by Lambert I do not believe in, but use good deep block tin dishes, and keep adding hot water as the developing goes on, finishing with it decidedly warm, as it cleans the picture up to perfection. I found quite clearly that putting the plate into a tank to develop, as hot at the beginning as at the finish, somehow or other damaged the tissue. You may use nearly boiling water without harm at the finish of development; but anything over 100° will damage the picture at the commencement; therefore, I use no tank, except for my supplies of hot water. After development I wash the prints well in clean water, and fix them in a solution of alum eight ounces to one gallon of water.

Transferring.—Too much care cannot be taken to see that the transfer paper is properly soaked. I had as much to puzzle out at this point as anywhere. If you don't soak long enough, your print shows a quantity of bright specks. I now use fairly hot water, and soak for near five minutes, and after the transfer I pile the plates one upon another, with several thicknesses of blotting-paper between, and keep them under pressure for an hour before stripping. I get very few spoiled prints, and waste but little tissue. I do not care to send my prints out with the full gloss of the collodion, but mount and roll them in the usual way, and take the liberty to send a few for your inspection. The enamelled surface is too delicate and tender for my liking, and the extreme gloss is not every person's taste. Practically the process is become, in my hands, instead of a complicated, an easy and certain one. I have a clever young printer, and there is no difficulty in turning out the work. I think these facts and hints may be a little useful to encourage and help others through difficulties. If others will try it throughout, I venture to say they won't regret the cost of a license, but will soon do what I hope to do in the coming spring—put on my cards, "Nothing but permanent photographs sent from this establishment." I have the exclusive chromotype license for this town, and must say I am delighted with the process, and would not part with my experience and the license for a great deal more than they cost me. C. J. Witcomb.

10, *Catharine Street, Salisbury, Nov. 27th.*

PHOTOGRAPHY UNDERGROUND.

Dear Sir,—Referring to Mr. A. Brothers' letter recently, I beg to state, for the credit of the reporter of the *Birmingham Post*, that I was applied to as to whether it was an unusual thing? I said that I believed that photographs had not been taken in a *coal mine* before; and I believe that the

Derbyshire mine is not a coal mine. I am aware of Professor Smyth's success, but have not had the pleasure of seeing the pictures. Photographs have also been taken of the Mammoth Cave of Kentucky, by an American firm.

Mr. Brothers says that it is not possible to take a light—requiring oxygen for its support—into dangerous places. I am prepared to do it, or to light up under water if required, as the product of oxygen and hydrogen being water, they may be burned, if the gases are pure, in a sealed case. I have had them in a bell-glass under water, and though my hydrogen was not quite pure, I maintained this light for some considerable time.

I could not use magnesium in the mine in which I had to work, as the working was not more than five feet in height, and badly ventilated, so that I was smoked out in a minute or two. I lit it for the last few minutes of exposure to finish up with, as it is much more actinic than the lime light.

Trusting that you will pardon my troubling you, and enclosing a stereograph of the mine, I remain, yours truly,

F. Brown.

[The stereograph with which Mr. Brown has favoured us is most interesting, and a remarkably successful example of photography under difficulties.—Ed.]

A NEW CAMERA.

Dear Sir,—Having seen a description of my new operating camera as described and illustrated in the *Scientific American* of June 24, will you allow me, in the interest of your numerous readers, with whom, if better known it might find favour, and also in justice to myself, to point out one or two inaccuracies of description for which the *Scientific American* is responsible, and which, but for the glaring absurdity, might have done me great harm, and may yet, with those who would not imagine that the absurdity arose from mere editorial inadvertence; also to supplement one or two points of information, which, probably owing to the same cause, were omitted, when it was highly advisable that they should be given. The general description, as far as it goes, in that paper is pretty good, but I think if you do not mind my taking up a little of your space, I shall be better able to give your readers a correct idea, both of its qualities, its general applications, and its working details, than is there to be found. I wish particularly to counteract the false impression that any of the solutions are poured into tin, zinc, or any kind of metal or other baths liable in any way to affect that very delicate and susceptible solution, "the silver bath." In fact, so desirous have I been of guarding against the possibility of contamination from that source, that I have even gone so far as to discard ebonite as unsuitable, it being well known that ebonite and gutta-percha become in time so rotten, through that or some other action, as to sometimes become as brittle as glass; hence the substance I have adopted for the baths is *carton durci*, which is very generally used by professional photographers all over the Continent. This will not break, even if thrown violently down, and has absolutely no effect on the most delicate photographic chemicals. The tin baths spoken of are merely used in lieu of a chariot to which the cords are attached, it being desirable that there should be facility for removing the former baths, for purposes of washing, &c., without disturbing the cord attachments. Likewise the wires which hold the plate are, as should have been stated, pure silver, for the reason above given. There was another point which has its importance, and was likewise omitted. Having found that stains on the fingers, which always look slovenly and dirty, even if they are not considered quite objectionable, almost if not always occur from handling bottles or baths which have just been poured out from, or from the cork in corking and uncorking, it was considered necessary to dispense with these two operations altogether, except when unforeseen circumstances rendered it absolutely necessary. This was found easy to effect by taking advantage of a very simple hydrostatical law, which has its embodiment in the well-known "Wolf's wash bottle." Air is forced into the bottle through one of the tubes by means of an india-rubber ball fitted with valves, this being considered less objectionable than using the mouth for the same purpose. The result is, the solution flows into the bath through the glass syphon; when it is to be emptied, the operation is simply reversed. By these precautions the most timid parent need not fear making a gift of the apparatus to any boy or girl, from the age of fourteen or fifteen upwards, if they be ordinarily careful, as much as they would naturally be if using ink, though, owing to the mechanical arrangements, its working is so cleanly that I would not hesitate to perform all the operations over the finest damask table cloth.

All mechanical readers will readily understand at a glance from the sectional drawings in your former notice how the machine is to be worked, whilst to others I shall be happy to explain it personally at any time they happen to call on me. The description you previously published in the number for July 14 is sufficiently accurate to give a very fair idea of the usual mode of working; it only remains for me to explain how the apparatus specially adapts itself to working with the microscope. As I am afraid, however, that I have even now taken up an unwarrantable space, I will, with your permission, defer it to another article.

Cireb.

[The description of our correspondent's camera was quoted, because of the ingenuity of the invention, from our American contemporary. We have recently had opportunity of inspecting the apparatus, and can bear testimony to the rare combination of simplicity and completeness. In the smallest possible space every facility for open-air working with efficiency is perfectly combined, and with a degree of systematic order which makes the working operations almost automatic, and renders failure altogether unnecessary, if not impossible.—Ed.]

CITRIC ACID IN THE DEVELOPER.

Dear Sir,—I find a developer composed of—

Ammonio-sulphate of copper ...	7 grains
Sulphate of iron	75 ,,
Citric acid	30 ,,
Water	1 ounce

to yield an exceedingly fine image, full of detail, but wanting in density; and I should be glad to know from some subscriber if he could recommend any different proportions or addition which would remedy this defect, as the great saving in using citric instead of acetic acid is evident; and as alcohol need not be used, it flowing quite evenly without it?

Trusting you can give a place to this in the News, I remain, your obedient servant, H. S. Ward.

4, *Castle Avenue, Clontarf, Dublin, December 4th.*

Proceedings of Societies.

Amateur Photographic Association.

A council meeting of the Amateur Photographic Association was held Nov. 23rd, James Glaisher, Esq., F.R.S., in the chair.

The Secretary mentioned that he had received a letter from Sir Antonio Brady, and a telegram from Mr. Howard, regretting that they were unavoidably prevented attending the meeting.

The minutes of the last meeting having been read and confirmed, the following members were elected:—Joseph Dell, Esq. T. L. Thompson, Esq.; Mrs. Deeble.

The Secretary then laid before the council the prizes which had been awarded at the annual meeting, viz.: a large elegantly chased silver goblet for Dr. S. Cooke, M.A., &c.; a silver goblet for R. Murray, Esq.; a large volume of photographs, by Mr. Stephen Thompson, entitled, "Chefs-d'œuvre of art and masterpieces of engraving," for F. Beasley, Esq.; a ditto for R. O. Milne, Esq.; an oil painting in frame for T. Brownrigg, Esq.; a silver goblet for W. S. Hobson, Esq.; a silver goblet for

J. McAndrew, Esq.; a large album elegantly bound in morocco for Dr. T. Cooke, M.A., &c.; an oil painting in frame for F. G. Lloyd, Esq.; an oil painting in frame for F. S. Schwabe, Esq.; also an oil painting in frame, for J. H. Ritchie, Esq.

It was proposed by Mr. Sopwith, and seconded by the meeting that owing to the late additions to the council, the secretary should have a new form of Honourable Mention prepared.

A. J. Melhuish, Hon. Sec.

Talk in the Studio.

Photographic Society of Great Britain.—At the next meeting of this Society, at 5a, Pall Mall East, on Tuesday next, December 12th, Captain Abney, R.E., F.R.S., will read a paper containing details of photographic operations connected with the Arctic Expedition, from notes by Mr. Mitchell, of the *Discovery*. Mr. Mandsley will describe "A New Method of Working in the Field."

Millinery and Photography.—The importance of studying the face to arrive at fitness of form and colour of ladies' head-dress, are so far recognized by Parisian milliners, that it is said that those who furnish ladies out of town with their hats, send for their customers' photographs before they make the selection of shape and colour of trimmings.

A New Adhesive Material.—An adhesive which, as far as colour and durability is concerned, is affirmed to surpass that made from gum-arabic, is made according to the following recipe, viz.: Milk is curdled by the addition of acetic acid (vinegar), and the precipitated casein, after being thoroughly washed with fresh water, is dissolved in a cold, saturated solution of borax. The result is a clear solution of syrupy consistence, possessing, upon drying, a fine lustre and highly adhesive qualities. This adhesive is recommended for a variety of uses.—*Druggist's Advertiser.*

To Correspondents.

** The Year-Book of Photography for 1877.—We have to thank a large number of our friends for the response to the invitation in our last to all readers who had hints and suggestions derived from their own observation and experience, which might prove useful in the pages of our forthcoming Year-Book, and aid in giving it completeness. As our readers know, our Annual owes the large esteem it now possesses throughout the world to the fact that it is a practical resume of the observations of many minds, the experience of many workers, and thus becomes a reflex of the actual position of photography in its latest state of progress. To secure this we are indebted to the communications of all the able workers and shrewd observers, both in the ranks of professional and amateur photography, and we again appeal to each and all of our readers for communications of hints and suggestions, however brief, resulting from their practice and observation. We have during the week received copy from H. P. Robinson, H. W. Arnaud, A. Cowan, A. Atkinson, C. Ferranti, Dr. Anthony, N. K. Cherrill, W. H. Watson, Captain Abney, Dr. Liesegang, G. Nesbitt, A. A. Mantell, S. Bottone, Dr. Phipson, F. G. Eliot, R. Mitchell, H. Baden-Pritchard, F.C.S., J. W. Neilson, F. Bedford, G. S. Penny, W. Mayland, W. T. Bovey, J. Werge, Captain Waterhouse, Colonel McMahon, W. E. Batho, J. Brier, jun., W. M. Ayres, P. Tagliacozzo, A. Ford-Smith, Tudor Williams, A. Johnston, T. Sims, G. W. Houghton, C. R. P. Vernon, A. C. Burgess, F. Beasley, jun., W. J. A. Grant, E. Viles, C. J. Eve, R. V. Harman, J. C. Stenning, Norman May, Frank Doré, "Loch Lomond," "Photo-Chemicus," and many others whose names are not before us. The early receipt of copy from other friends will be esteemed a favour.

G. A. H.—As a rule, stereoscopic views are now-a-days produced with a binocular camera. In fact, it might be safe to say that all stereo views taken professionally—that is, with a view to publication—are taken so. In some cases, of course, one lens may be used, moving the camera on the sliding bars devised by Latimer Clarke. To produce the result you describe, the simplest plan is to cut and transpose the negative.

D. S. J.—By applying a weak solution of chloride of gold—say one grain in two ounces of water—to the negative, you may make it visible as a positive at the back of the glass. You must watch the operation, because, if continued, it passes the stage desired. This process also slightly intensifies the image.

Italy.—The address of the Rev. W. A. C. Atkins is Castle Hill Ealing.

Globe.—The intention of the Copyright Act is to protect the owners of a copyright picture from all forms of copying, whether by photography, lithography, engraving, or any other mode of imitating. A newspaper issuing an engraving of a copyright photograph without permission of the owner is liable to the penalties of the Act. In the case you describe, you doubtless may recover heavy damages. According to the terms of the Act, the person selling pirated copies may be condemned to forfeit ten pounds to the owner of the copyright for every copy sold. See that your steps in securing your copyright have been properly taken, and place the matter in the hands of a respectable solicitor.

Ashley.—The only certain mode in which you can ascertain whether a picture is copyright is by enquiry of the owner or photographer who produced it. Search for registration is permitted at Stationers' Hall on payment of a fee. The precise amount we do not remember. It will probably vary with the number of years through which the search is necessary. But bear in mind the non-entry at Stationers' Hall does not invalidate a copyright; it only precludes action against any piracy made before entry. The safe rule is to assume that all photographs are copyright unless you have clear evidence or the admission of the photographer to the contrary.

Collodion.—The salts of potassium are sparingly soluble in highly rectified ether and alcohol, and we have found some samples especially troublesome in a tendency to precipitate. The only remedy in such case is to add a few drops of distilled water, a drop at a time, agitating well between each. Do this with a small quantity of the collodion, so that if you get excess of water you can easily rectify the error by adding more unwatered collodion.

W. Perry.—We do not know of any house who supplies cloud negatives, either in silver or carbon. No doubt the production of such negatives by the carbon process for sale might be made a remunerative enterprize.

E. Williams.—The skylight in question doubtless forms a truncated pyramid. The precipitate was probably sulphate of silver, which is very sparingly soluble in water.

Alloa.—We do not know of any toning process for silver prints, which we consider good, which does not contain chloride of gold. Sulphur toning may be produced by adding acid to the hypo fixing bath; but we do not consider it good. Platinum toning may be effected; but it is not so easy to work, nor so good when finished, as gold toning. So the other noble metals, such as rodium, indium, iridium, &c., may be used, but none are superior, or, indeed, equal, to chloride of gold.

Printer's Devil.—We are not familiar with the technical details of polishing opera glasses.

R. E. X. (Northampton).—The cards of which you enclose a sample are doubtless printed expressly for the purpose for which they are employed. Your local stationer could probably obtain you something of the kind by ordering of a wholesale fancy stationer. Such a house as De la Rue, of Bunhill Row, could doubtless supply them.

R. G.—Magnesium gives a very fine brilliant light for the magic lantern; but it has the disadvantage of being somewhat intermittent. The slides are better without varnish, and protected with glass.

T. G.—Unused hyposulphite solution may be kept in a cool dark place for a long time. But, as a rule, compounds formed of bodies with weak affinities, and, therefore, easily decomposed by a variety of accidents, should not be kept long in solution in large quantities. 2. Sulphocyanide of ammonium was some years ago proposed as a substitute for hyposulphite of soda as a fixing agent for prints, but was not found to answer quite satisfactorily. It is sometimes used still in making toning solutions, and it is occasionally used in fixing negatives. 3. The toning and fixing bath in one was at one time commonly used, and is still a favourite with some persons; but, as a rule, it has quite gone out of use. It is difficult to use it without risk of sulphur toning, which is unstable.

C. C. S.—Your letter, but without the prints, has arrived. We shall have pleasure in seeing further examples. Possibly the prints may still come; but we have had the letter a week.

Received.—"Men of Mark," "English Celebrities of the Nineteenth Century," "Thebes, and its Five Greater Temples," by Captain Abney, "Sketch of George Dawson, with permanent photographic portrait."

D. W. Whetton, W. Cobb, and several correspondents in our next.

PHOTOGRAPHS REGISTERED.

Mr. Jarman, Ramsgate,
Two Photographs of West Cliff House, Ramsgate.
Photograph of Mrs. Hill's House, St. Lawrence.
Photograph of Townley House, Ramsgate.
Mr. A. McLeod, Manchester,
Photograph—Caricature of Mr. P. Rylands.
Mr. H. Pointer, Brighton,
Two Photographs of Dogs.

The Photographic News, December 15, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Colour-Blindness—Photographic Societies throughout the Land—Costly Cliches and Copyright.

Colour-Blindness.—The human eye seems as powerless, sometimes, to appreciate colour as the ordinary photographic film; and, if we are to believe some reports that have been recently made on the subject, colour-blindness is not so rare an occurrence as many imagine. In the same way as a red or deep yellow is rendered dark by the sensitive film, so, it appears, these colours seem to the retina of the eye. A man who is colour-blind sees very little difference between a white light and a green one; while a red flag and a black flag are to him very nearly the one and the same. The question of colours is of so much importance to photographers, that they cannot but feel an interest in these matters; for a good eye for colour and effect is one of the principal elements in the making of an artist. Colour-blindness is most frequent, it seems, in southern latitudes, where the sun's rays are very fierce and light is the brightest; but in the more northern countries the affliction is quite marked enough to merit attention. Professor Holingren, a Scandinavian *savan* has lately been occupied with the subject in Sweden, and as, probably, the possession of good eye-sight is of more importance among railway officials who have to do with coloured signals, the Professor made a thorough investigation of the whole staff of one of the Swedish railways. Of these officials he found that no less than seven per cent. were afflicted with colour-blindness, and were quite unable to distinguish between the different colours. Such men were, of course, totally unfit to act as guards, drivers, signalmen—or, indeed, in any responsible capacity connected with the working of the line. The staff examined by Professor Holingren consisted of two hundred and sixty-six persons, and of these no less than eighteen were declared to be incapable of performing properly the work they had to do, simply by reason of their defective eye-sight in this respect.

Photographic Societies throughout the Land.—Last week we gave some statistics relative to the number of photographic journals that are published. The importance of photography, now-a-days, may be further estimated by the number of societies that are in existence for furthering the art. Of these bodies there are at present, it appears, no less than forty—or, if our brethren in Australia have founded any such institutions, even more than this number. They are scattered over Europe, America, and Asia. America, indeed, stands first on the list with sixteen societies and associations of one kind or another. There is the National Photographic Association and the Boston Photographic Association to begin with. Then there is the German Photographic Society of New York, a branch of the Berlin Society, over which Professor Vogel so ably presides; the Photographic Section of the American Institute; and the Brooklyn Photographic Art Association. The others are societies or associations connected with Baltimore, Philadelphia, Ohio, Pennsylvania, Washington, Chicago, Indiana, Galesburg, Buffalo, and San Francisco. England comes next upon the list, and is represented, it seems, by eleven societies, some of which, as our readers know, are, unfortunately, scarcely so flourshing as might be the case. They are the London and South London Societies, and the Amateur Photographic Association, which has also its head-quarters in the metropolis. Then come the societies of Cheltenham, Bristol, Edinburgh, Liverpool, Manchester, Oldham, and West Riding of Yorkshire. There is also the Photographic Benevolent Association, whose purpose is, at any rate, indirectly to assist the art. Germany proper has six societies including that of Cologne, which was formed but the other day, and starts worthily with thirty-six members. The principal body is, of course, the Society for the Advancement of Photography at Berlin, which musters no less than two hundred and eighty-nine members. Another society still seems to exist in the Prussian capital, but does nothing else, apparently. The other three societies are at Hamburg, Bremen, and Frankfort. France has three societies devoted to photography: The French Photographic Society at Paris, and the Societies of Marseilles and Toulouse. The Netherlands and Switzerland are each represented by one Society, and Belgium also, the latter having branches at Brussels, Ghent, and Liege. Finally comes Asia, with the Bengal Photographic Society.

Costly Cliches and Copyright.—Our friends in Germany are somewhat astonished at the price recently paid in England for a photographic negative, and imply that on the Continent a simple cliché would never have commanded so high a price. At the sale of effects of Mr. Chas. Watkins' studio, a negative was purchased by Messrs. Marion and Co. for £185, the subject being His Royal Highness the Prince of Wales in full Masonic costume. No doubt there were many reasons that conduced to so high a sum being paid; but we can assure our German cousins that many British photographers have possessed plates of far higher commercial value. Many of the negatives taken now-a-days would be valued at this sum, and a few years ago—the portraits of the Prince and Princess of Wales, for instance, taken in their bridal robes, by Mayall—five or ten times that sum would have been refused for clichés. In the case of the picture taken by Mr. Watkins, there are many reasons why it was of value. Though scores of good negatives have been taken of the Prince of Wales, it was probable that a long time might elapse before an opportunity would again occur of securing him in his Masonic costume, and it is the circumstance of his being so attired when photographed that gives the value to the negative. The number of Freemasons throughout England and the Continent who would eagerly purchase the picture must be very large, and thus an energetic demand for prints would be continually recurring. But there is another reason, as a German contemporary very wisely points out, why, in the Fatherland, a negative can rarely attain to such a price. It is the circumstance that piracy exists to a great extent. It says much for the observance of our laws in this country, says our contemporary, to find a single portrait negative selling for the sum of £185, for such a transaction affords ample proof that the law of copyright is strictly enforced. No one would expend so much money upon a photographic cliché if, the day after a print of it appeared in the shop windows, there were piracies all over the town. We have good reason, therefore, to deem ourselves fortunate in this country for the protection we enjoy through the registration of photographs, and trust that the time may not be far distant when our German cousins will enjoy similar privileges. Fortunately for photographers, it is no easy matter to secure a presentable copy from a small paper print, and a purchaser must be very easily duped who cannot see the difference between an original photographic print and a copy that has been made from it. The owner of the negative, if he does not permit this to be reproduced, has therefore "nine points of the law" in his favour at any time; but it is, of course, more satisfactory to have all ten. German photographers have for years past been striving to obtain better protection for their work, and it must be exceedingly vexatious to see from time to time negatives being sold at a high figure, which they themselves might obtain, if only their copyright laws were as stringent as those in Great Britain.

THE AIMS AND OBJECTS OF PHOTOGRAPHIC SOCIETIES, WITH SUGGESTIONS FOR INCREASING THE PROSPERITY OF OUR OWN.

BY MR. YERBURY.*

In thus occupying the attention of the meeting for a few minutes, my object is not to propose any alteration in the way in which the Society has hitherto been conducted, and under which it has attained to such a large measure of success; neither is it to propose any particular addition to what may be called our ordinary programme, but simply to throw out several suggestions with the view of leading to a discussion, the outcome of which may still more increase our prosperity.

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* Read before the Edinburgh Photographic Society

The aims and objects of photographic societies generally no doubt vary according to circumstances, but there are a few things which they in common all seek to attain, and to these, or the most important of them, I intend at present to confine myself. Those are, first, the advance of photography, both as an art and a science, or artistically and technically; secondly, the educating and elevating of the public taste to appreciate the true and beautiful in art, whether exemplified in photography or painting; and third, the bringing of men together who have much in common, for that social intercourse which tends so much to remove the trade jealousies, and round off the angularities, so generally incident to isolated members of a community.

Keeping these three objects in view, it will be evident that the first aim of those to whom the management of such societies is more immediately committed, ought to be the getting of as many names as possible on the roll of membership, and the securing of as large an attendance as possible at the ordinary and stated meetings. In our own Society the former has been obtained by a low rate of subscription, and the latter, by securing that as far as possible a part at least of the proceedings shall be sufficiently popular to interest others than those immediately connected with photography.

That the Edinburgh Photographic Society has been, to a large extent successful, there can be little doubt, and therefore I do not think that wisdom would be shown by any considerable departure from the present system of management. Our small rate of subscription requires a large number of members to bring the funds up to the required figure, and our popular meetings have done much to make the enlisting of non-photographers an easy matter, while the occasional distribution of prints at ordinary meetings secures generally a large attendance.

While, however, averse to disturb the present arrangements, on the ground of their perfect suitableness to our requirements, I think that something additional might be grafted on to them that would tend still further to increase its prosperity and enhance its value, especially to those who have but a limited interest in the papers that are read and discussed at the ordinary meetings.

I take it for granted that practical photographers are too much alive to their own interests to need any greater inducements than the ordinary papers, and consequent discussions, to ensure their attendance at the meetings; but in most communities the photographic element is too limited for the healthy carrying on of a society, and therefore it is that the sphere must be considerably extended; and as this extension can only be made by special attractions, the question arises as to what form that attraction ought to take. Probably the best way to arrive at an answer to the question will be to ascertain from the office-bearers if there be a weak point anywhere —a joint in the armour—and then, having discovered it, see how it can be strengthened or repaired. This, in a small way, I have attempted to do, and find that there is a weakness, a very small crack indeed, but still a crack, that is worthy of attention — namely, a difficulty in promptly getting in the annual payment of the five shillings necessary to constitute membership. This difficulty, arising, no doubt, to a large extent from the very smallness of the sum, might, I think, be readily overcome, and several other benefits conferred on the members generally, by the outlay of a small sum of money.

What I would suggest is this, that there should be an annual distribution of a print, of not less than ten by twelve inches in size, from a high-class negative selected for the purpose, and presented to every member whose subscription had been paid before a certain date, say about Christmas. I have no doubt that the use of a suitable negative might be got for nothing, or rather for the fame which such a proceeding would bring, and the prints, either in autotype or Woodburytype, would cost about £12. This may, by some, be considered a large sum out of our small income, but, after much consideration, I think the scheme would be well worth a trial. If it should be considered so, I think there could not be a more opportune time for it to be put in force, as our funds are in a condition sufficiently prosperous, and the negative might be selected from the pictures in the forthcoming exhibition.

It is with societies very much as it is with men; in our young days we see the world before us, and start with a resolution to do great things, but with riper years come more limited desires, and, too often, we are content, or are perforce obliged to be, with sufficient for the day.

Some of those present will remember that the founders of the Edinburgh Photographic Society placed before themselves a most ambitious programme, in which were included a large glass house stocked with model apparatus for the use of the members, and a spacious hall in which the meetings of the future should be held. I suppose, however, we have now arrived at the years of discretion, and have no hope, and hardly an ambition, to do more than keep out of debt, and do the most we can in each year with the year's income.

I do not, however, wish to be understood as advocating the spending year by year the entire funds of the Society. I have too keen a recollection of the difficulties through which we have more than once passed, and would strongly advise that a sum of at least £50 should be kept to our credit, available in any case of emergency that may arise.

ALBUMEN.

BY A. CLARK.*

This name is applied to a certain organic body which constitutes the characteristic portion of the white of egg, and of the serum of blood, and forms a constituent both of the animal fluids and solids. There is also a vegetable albumen found in certain plants, such as the potatoe, carrot, turnip, cabbage, asparagus, and the green stem of the pea, &c., which has apparently the same composition as animal albumen.

The most remarkable character of albumen is the property it possesses of changing from a fluid to a solid state on the application of heat. This process is termed "coagulation." If the white of an egg be exposed to a heat of about 140° Fahr. white fibres begin to appear in it, and if the heat be raised to 160° Fahr. the fluid substance is converted into a solid mass, which is opaline and insoluble, and is possessed of considerable elasticity. If the heat be still further increased to 212° Fahr. it dries, shrinks, and assumes the appearance of horn. It can, however, be dried at a temperature of 140° Fahr. without being rendered insoluble, and it is in this form that it is usually met with in commerce. It is inodorous and tasteless, and is insoluble in alcohol and ether.

The chemical composition of albumen has not been ascertained with certainty, as it is so readily split up by different chemical agencies into many other substances for which it is difficult to obtain an exact chemical formula. Recent analyses, however, by G. S. Johnson, of some remarkable compounds of albumen with the acids confirm the formula originally proposed by Lieberkuhn, namely, C_{72} H_{112} N_1 SO_{22}. The percentage composition is in round numbers:—

Carbon	55	per cent.
Hydrogen...	7	,,
Nitrogen	16	,,
Oxygen	21	,,
Sulphur and phosphorus... ...	1	,,
	100	

Albumen, whether obtained from eggs, blood, or plants, has the same constituents.

White of egg consists of about twelve per cent. of albumen, eighty-six per cent. of water, and small quantities of soluble salts. It is alkaline from the presence of a little soda. Raw white of egg has no smell of sulphuretted hydrogen, and does not blacken silver; but after boiling, both these properties are manifest, showing that it suffers some decomposition during coagulation.

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* Read before the West Riding of Yorkshire Photographic Society.

In proportion as albumen is diluted with water it requires a higher temperature to coagulate it; but water with only $\frac{1}{1000}$ part of its weight of albumen dissolved in it is rendered opaque by boiling. After coagulation it is no longer soluble in water unless heated with it under pressure, but it dissolves in caustic alkali. The only chemical change that can be traced is the loss of alkali and soluble salts, which are removed by the hot water.

Albumen is coagulated also by alcohol and by all the stronger acids, as sulphuric, nitric, and hydrochloric acids; but not by acetic acid, as that dissolves it. It is also coagulated by the metallic salts, such as chloride of tin, chloride of gold, and acetate of lead; and so delicate a test of the presence of albumen is bichloride of mercury that, if a single drop of a saturated solution of that salt be let fall into water containing the two-thousandth part of albumen, it will occasion a milkiness in the water, and produce a curdy precipitate. Albumen is also coagulated by the action of voltaic electricity.

The yolk of egg contains a modification of albumen called "vitelline," and owes its yellow colour to a yellow oil, which may be extracted by ether, and contains phosphoric acid.

It is a well-known fact that certain industries consume a very large quantity of albumen in some shape or other. Sugar refiners, tanners, and glove-leather makers employ albumen in a more or less pure state—in some instances the yolk of egg only; but the calico printers are the largest consumers, it being used by them as a mordant for dyeing cotton goods with aniline colours. This consumption is steadily on the increase. A short time ago it was stated in a scientific paper that the printing-works of Alsace alone consumed annually more than 150,000 kilogrammes of dried albumen, representing rather more than thirty-seven millions of eggs, or the production of 250,000 hens. Add to this the consumption of the printing-works in the other parts of France and of other countries, and there is very little doubt that annually some one hundred and fifty millions of eggs are used for that purpose alone.

Two kinds of dried albumen from blood are known in commerce, namely, the natural albumen without gloss, and patent or glossy albumen. The white of egg can also be purchased in the form of a dry powder, and it has been proved to be perfectly soluble. Dr. J. Schnauss has already borne testimony to its value in the preparation of dry plates, and, being in the form of a powder, it is very economical, as no more solution need be prepared than is required.

Albumen has never been obtained perfectly free from saline matters, particularly the alkaline and earthy phosphates; and for photographic purposes it is very probable that the sulphur present in albumen is very detrimental to silver prints. Experiments have been made from time to time by chemists, with a view to the separation of the sulphur from albumen, and whether, if it were removed, the albumen would still retain its properties, is yet an open question. That there is reason to believe that some process will yet be discovered, may be inferred from the fact that M. Schützenberger has ascertained that when pure albumen is coagulated by heat, it always leaves a small amount of soluble residue, amounting to from five per cent. to seven per cent. of the original albumen. He states that this residue is of a clear yellow colour, has a bitter taste, and, what is of more importance to photographers, contains sulphur. Although the albumen, after being coagulated, is of no use to the photographer, still it is a step in the right direction, and perhaps we may ultimately be able to prepare albumenized paper, &c., without having the presence of this deleterious substance.

The defects in some albumenized papers may also be attributed to the fact that highly-glazed paper is much in demand, and it can only be produced from albumen that has undergone fermentation. Such paper is often unequally sensitized, and shows circular markings, tear-drops, and blisters, as pointed out by Mr. Bovey some time ago.

Albumen is often recommended as a coating to plates before the coating with collodion, and is, no doubt, of great service in the working of dry plates, but probably a fruitful source of injury to the silver bath, if adopted in the ordinary wet process. Clean plates and good collodion render its use unnecessary. If used, it should be a weak solution, about one part of albumen to twenty or twenty-five parts of water, and filtered before use.

In conclusion, I would say that, although dry albumen from a good maker can be relied upon, still there is no doubt that the cheaper qualities are adulterated with such substances as gum, dextrine, or British gum, or starch, and, sometimes without being adulterated, may be of inferior quality, owing to having been dried at too high a temperature.

In reference to gelatine, I can say very little; it is prepared from animal substances only. That quality generally used by joiners as glue is prepared from the refuse of the tan-yards, consisting principally of scraps and parings from the raw hides, though it can be, and probably is, prepared in some places from bones. Isinglass is a very pure variety of gelatine, prepared from the air-bladder of fishes, more particularly that of the sturgeon. The composition of gelatine is usually stated by the following formula:—$C_{41} H_{67} N_{13} O_{16}$, and also a trace of phosphate of lime and magnesia.

The characteristic properties of gelatine are the tendency of its solution to gelatinize on cooling, and the formation of an insoluble compound with tannic acid and some other substance—for instance, chrome alum by the action of light. The formation of an insoluble substance by the action of tannic acid is the foundation of the art of tanning, and the action of light on a mixture of chrome alum and gelatine the essential principle in the production of carbon prints. A solution containing only one per cent. of gelatine will set on cooling, and this property renders it valuable in the making of jelly, size, and glue, though, if repeatedly boiled and cooled, it loses this property.

Gelatine is largely used for sizing paper, clarifying liquids, such as wine and beer, and as a cement. It is also used in various ways in the art of photography, with which, no doubt, many present will be more familiar than I am.

VIOLET LIGHT FOR STUDIOS.

BY M. SCOTELLARI.*

The question of rapidity of exposure is one which occupies the general attention of all those engaged in photography, and I, who have given it some consideration, have the honour to submit herewith a memoir treating of photo-chemical sensitiveness, or true artificial photogenic light applicable to the art of photography.

In the interests of science, art, and industry, I hope that the members of the French Photographic Society, to whom the matter is necessarily one of interest, will be good enough to study well the immense advantages which result from such application. The violet rays of the spectrum, more than any of the others, having chemical properties and possessing the least amount of caloric, I have conceived the idea of applying this tint to the studios, cutting off all other rays which are injurious or of no value. To do this, without having recourse to violet glass, which would be much too costly, and which, moreover, would lack that uniformity that is necessary, I have confined myself to covering the ordinary glass of the studio with a varnish tinted to a certain colour, and I substitute violet curtains for the drapery usually employed.

I may mention briefly the scientific results upon which I have based my system of lighting.

1st. The luminous power of violet surfaces, which, according to Draper, reflect the maximum of the light that they receive.

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* *Bulletin de la Societe Francaise.*

2nd. According to the experiences of Fraunhofer and Herschel, it is in the yellow where the maximum intensity of the light is to be found, and in the violet where the minimum is; but according to Scheele, it is the violet light which has the maximum chemical intensity. The luminous part of the spectrum which we have to consider is only produced in certain limits of undulation of the ether.

In fact, it is well known that so far as the violet is concerned, the number of undulations rises to 728 millions of millions per second, while in the case of red they are 496 millions of millions only. This may be seen on reference to Stokes' researches upon the chemical power of the spectrum.

In a great number of phenomena, light acts in the same way as a chemical agent. For instance, the proto-chloride of mercury and the chloride of silver blacken by the action of light; diaphanous phosphorus becomes opaque. At the same time, the different colours of the spectrum do not possess the same chemical action, and as I have just remarked, it was Scheele who was the first in 1770 to observe that chloride of silver exposed to light takes up a violet tone, and he showed that it was the violet ray of the spectrum especially which produces this effect.

M. Prat, the skilful chemist of Bordeaux, who has assisted at my experiments, passed the following opinion upon them:—

1. Violet light operates much more rapidly than blue or white light, diminishing as nearly as possible the exposure by one-half.

2. In consequence of the homogeneity of the tinted light projected upon the face of the sitter, the clichés produced were more successful, and there was less reason, therefore, for retouching them.

3. As regards the fidelity of the portrait, certain persons very impressionable in ordinary light were not so under the influence of violet rays; moreover, the likeness was more perfect, and the face more calm.

4. As regards the artistic character of the results also, photographs taken under the exclusive influence of violet rays are much better modelled, and have more details in the clearer parts and in the shadows, so that the general appearance of the pictures is finer than those obtained in the ordinary manner.

THE SUPPOSED DIFFICULTIES OF CARBON PRINTING.

BY PROF HERMANN VOGEL.*

Over and over again have I remarked that photographers who have learnt pigment printing in my studio, and have succeeded very well under my auspices, have been able to get along indifferently when they begin the task under other roofs. On a closer examination of the matter, I soon found out the reason for this, and it was that the *locale* where the work was carried on was unsuitable for it. Many have tried to dry the pigment tissue in apartments down the walls of which the moisture ran in streams, or where there was not the slightest current of air. Again, it was essayed to read a photometer by the aid of a lamp quite unsuitable to the purpose; and sometimes I have found the supply of baths and utensils to be quite insufficient, so that the moistening of the impressions before squeegeeing, the development, rinsing, and tanning with alum, had all to be undertaken in one and the same vessel. In this case, as a matter of course, it is simply impossible to avoid dirt and contamination of one sort or another, and this, in carbon printing, is a matter of very great importance, for the carrying out of the manipulations necessitates the greatest degree of cleanliness.

Further, I have remarked that the printers invariably forget that pigment tissue is far more sensitive than silver paper, and for this reason the work-room must be kept much more dark than under ordinary circumstances. I know several large studios in which I have sought in vain for suitable localities for pigment printing. The pigment tissue I have seen drying in a room which was nothing but a thoroughfare for everything, through which people and dust and light all made their way. The panes were fitted with tissue in a place that was far too light, and it was the same with the development of the tissue. It was scarcely to be expected that the results should be satisfactory.

That the difficulties of carbon printing are materially in summer time, when the gelatine runs down the drying tissue in streams, is but obvious; but this difficulty may be got over if you have any cool cellar-room at your disposal. The photographic public must bear in mind that they have here to do with a very beautiful, but at the same time perfectly strange, process, which demands precautionary measures of a totally different kind to those required in silver printing. *Those, therefore, who are insufficiently fitted out with proper room and apparatus, and attempt carbon printing, will but seldom succeed.* Hence the non-success of numerous photographers who have but a superficial knowledge of the subject, and who play rather than work with the new method.

My advice to those who want to begin carbon work is first of all to make some photometer paper, and to get some experience in the employment of the photometer. Then the learner may proceed to sensitize a few pieces of tissue of cabinet size, and print them to 15° on the scale, or until the No. 15 begins slightly to show in the photometer.

Afterwards he may begin to try the single transfer process upon paper (the first picture is almost sure to be spoilt by the squeegee), and then he may print another piece of tissue another two degrees further, to try the single transfer process upon glass. Having done this he may proceed to the double transfer process, and finally to the production of fine diapositives for the production of enlargements and multiplication of negatives.

It is not unfrequenlyt stated that the numbers in the Vogel photometer are sometimes difficult to read, because the figures appear so faintly, and therefore it is easy to make a mistake over one or two degrees. This is altogether an error. If only the pupil will attend to the instructions for its use, the reading of the photometer is easy and sure. I have sometimes given as many as four persons, and even more, an exposed photometer to read off, and all of them have agreed as to the degree it registered. A practice of a couple of hours suffices to become quite certain in the use of the photometer, supposing everything to be properly in order. Generally, however, the following mistakes are made.

1. The strips of chromate paper are cut too long and too broad, and the consequence is that they stick fast in the box of the photometer, and are then unequally pressed by the spring. The result is that the figures are not printed sharply, and, under the circumstances, are of course very difficult to read.

2. The pressing block under the sensitized paper is sometimes put in reversed. The same should lie with its notched surface uppermost, so that the sensitized paper is rather pressed out of the box. The more the strip of paper is pressed against the scale, the sharper will the figures be printed, and the better will they be recognised.

3. The chrome paper is often exposed to open daylight, and it then becomes affected and less sensitive.

4. A bad lamp or ill adapted shade is often taken for reading the figures. This must never be. When it is a matter of observing delicate light records, like those upon a photometer, the eye must be shielded from any glaring light.

I may, moreover, remark that the letters printed beside the figures have a purpose, and a very material one, for they aid the eyes in recognising the number; for instance, if the eye cannot perceive the figure, but observes the letter and the outline of the hand beside it, we may be sure that the degree has been reached, although it is not marked upon the photometer scale.

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* *Photographische Mittheilungen.*

FURTHER PARTICULARS OF THE LEAD INTENSIFYING PROCESS.

BY DR. J. M. EDER AND CAPT. TOTH.*

Formation of Relief upon the Negatives.—Every image that has been intensified with lead and sulphur betrays, after drying, a very marked relief, which is much more apparent than in the case of other intensifying methods. This relief may be employed, so prominent is it, in the production of typographical printing blocks.

If negatives intensified with silver are treated with the lead bath to secure relief, two difficulties will be found to arise: in the first place, by reason of the fogging that has occurred during the process of intensifying with silver, the relief will not be so marked, from the fact that the prominences and hollows will become equalised; and, secondly, the thin collodion film is covered with precipitate of such a nature that it approaches the thickness of cardboard in opacity, and then tears away from the glass. We have not, tried a preliminary coating to prevent such a catastrophe.

Till now we have always assumed that the white negatives, after immersion in the lead bath, were treated with sulphide of ammonium and blacklead to make them more permanent and opaque. There are other methods of increasing the permanence and opacity of the film, and of these we will refer to two.

Chrome-lead Intensifier.—If a well-washed and moist lead image, by which we mean a white negative consisting of ferrocyanide of silver and lead, is treated by pouring over it a solution of chromate or bichromate of potash, it almost instantaneously assumes a light-yellow colour under the formation of chromate of lead (chrome-yellow); only the ferrocyanide of lead is changed into chromate by the solution of chromate of potash. This method we will call the chrome-lead intensifier.

The yellow colour of such a negative is stable under the influence of light, and is very opaque, although scarcely so much so as the plates blackened by means of sulphide of ammonium, so far as we have tested by means of chloride of silver paper. It is noteworthy that the simple chromate of potash (we employ a solution of 1 : 10 strength) gives much more intense negatives, and of a deeper yellow colour, than a solution of similar strength made with the bichromate salt, and for this reason it is that we prefer to employ the former. If the plate is too thin after tinting with the chromate solution, it may, after again washing, without injury in the lead bath, be once more treated with the chromate solution. After the blackening of the lead picture with sulphide of ammonium, the use of the bath a second time is of little or no use, for the sulphide of ammoconverts the metallic silver into sulphide of silver, which is not acted upon in the lead bath.

Covering up of the details on fogging is a defect that need never be feared from the use of chromate of potash any more than from sulphide of ammonium. An error is here less possible than in the case of the fogging which is produced upon negatives coming out of the lead bath, and which was imperceptible in the first place on the thin unintensified silver negative; for the clear portions of the lead image remain also clear in the chromate image, and the negative gains in vigour proportionately only.

The remark of Captain Waterhouse, that a plate treated with chromate of potash often gets covered in the lines, has astonished us very much. This can only be an error, for negatives free from fog by treatment with chromate of potash are only then obtainable when the lead negative is weakened by the colouring process, as Waterhouse does with his method (iodide of iron and hyper-manganate of potash). That a defective result may be brought about by a previous clearing up of the negative, or by less intensifying, and allowing the lead and chrome colour to remain, thus obtaining an incorrect comparison of the method, is clear enough.

The chrome lead intensifier we place next in rank to the sulphide of lead intensifier. It yields an intense film, and has not the disagreeable characteristics of sulphide of ammonium. It does not give a film as dense, neither do any other of the modifications of the sulphide of lead process; at the same time it does not appear less permanent than the latter, and should receive considerable application in practice. Those who do not like to employ sulphide of ammonium should try it.

To glance for a moment at Captain Waterhouse's lead intensifying method, we find that he recommends the treatment of the lead picture with iodide of iron solution, and subsequently with permanganate of potash. According to our experiments with this method, it is not to be recommended, for one gains neither in density nor simplicity; the contrary is the case, while the results are not only inferior to those secured by sulphide of ammonium, but by chromium salts also. In treating even the most thoroughly washed white lead negative with iodide of iron solution, iodide of silver and iodide of lead are formed, together with a blue precipitate, which on exposure to air rapidly becomes darker, by the formation of Prussian blue. Permanganate of potash colours the film brown, without rendering it scarcely more vigorous.

Should anyone, nevertheless, have a wish to try the process in this form, with the additional employment of iron salts (which we scarcely think probable), we may recommend the substitution of chloride of iron in place of the dearer and more difficultly obtainable sub-iodide of iron. There is then formed, besides chloride of silver and chloride of lead, Prussian blue also.

The most rational of such processes which produce brown negatives by the use of permanganate of potash we find to be the following:—The negative taken out of the lead bath is washed and poured over with permanganate of potash; strengthened in this manner, the cliché is not inferior to those produced by the Waterhouse process in density, but come much after sulphide of lead plates and also chrome-lead clichés; they are, however, denser than the white lead images.

The Behaviour of the Lead Image in Presence of Reagents.—A more perfect knowledge of the lead intensifier in the presence of certain reagents is a matter of universal interest, and forms a connecting link with further investigations of the process; it will also probably give the practical worker much that is of value. In the following lines we give the results of an investigation made by us upon the properties of the lead image; these results show that the picture is capable of being much changed by various reagents, thus leading us to hope that "new processes" may spring from the study before us.

1. *Hyposulphite of soda* dissolves the lead image completely, no doubt ferrocyanide of silver as also lead going into solution; for this reason we use it as a clearing medium.

2. *Cyanide of potassium* weakens the image not immaterially. It only dissolves the silver. The ferrocyanide of lead becomes cyanide of lead, which is insoluble in an excess of cyanide of potassium, and remains in the image. The latter forms the principal part of the picture, and, for this reason, the weakening action of this reagent is not very deep. Treated with cyanide of potassium the image becomes cyanide of lead, and behaves as follows:—Hydrochloric acid dissolves it under formation of chloride of lead; hyposulphite of soda is without influence; and the same may be said of iodide of potassium and permanganate of potash; chromate of potash transforms it slowly into chrome-yellow; chloride of iron forms chloride of lead, which dissolves at once on washing in water.

3. *Sulphide of ammonium* blackens the lead image (as it does all lead and silver compounds) with the formation of metallic sulphides; upon this reaction is based our first method of intensifying. The black image is not changed by any of the reagents here referred to.

(To be continued.)

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* Continued from page 580.

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CARBON PRINTING IN COMMERCIAL PORTRAITURE.

There is probably no question of more vital importance to portraitists at the present moment than the inquiry which constantly reaches us: is it possible to make any form of carbon printing commercially available for the daily work of portraitists? Notwithstanding the steady improvement made during the last twelve years in the processes, and notwithstanding the experience gained in the greatly extended practice, there are still difficulties which stand in the way of the universal adoption of this method of printing for the daily work of even the most skilled and the most conscientious of photographers. The desire to adopt a method of permanent printing has extended and is extending, as we learn by the repeated inquiries and the multitudinous complaints which reach us. Here and there a conservative photographer may be found who chuckles and exults over the difficulties or failures in carbon of which he may hear. But the general cry, the earnest inquiry is: how may we conquer the difficulties which baffle us in trying the general use of carbon? How shall we get rid of granulation and reticulation? How shall we deal with gelatine films in the varying climate and temperature of England? How shall we get good tissue of uniform quality?

That these and other difficulties are in course of extinction we have no doubt. In the course of some country rambles during the summer we were agreeably surprised to find M. Lambert's licensees much more extensively distributed, and, judging by large displays of specimens, apparently working more successfully, than we had anticipated. In some of the studios we visited we found the work going on successfully and satisfactorily. In the studio of Mr. Ferranti, for instance, at Liverpool, where we saw some of the finest examples of carbon printing which have come under our notice, we learn from Mr. Ferranti that when he could himself superintend the operations, he found them much more satisfactory than silver printing, and the chief difficulties of a manipulatory kind in his hands had vanished.

Carbon printing is, however, a skilled industry in many points essentially different from silver printing, requiring other conditions and other experiences to master those conditions. The mere fact of understanding photography generally gives no especial qualification for carbon printing. There is a curious error into which many sanguine persons are apt to fall. They take it for granted that because their business is photography, they ought to be able to succeed in any photographic operation at once, forgetting that carbon printing is in many respects practically a new trade. Tuition, oral or written, aptitude, and experience are necessary to success, and these aids combined are certain to bring success. The evidence of this is found in the fact that in spite of the difficulties which bewilder many, many do succeed. No more satisfactory example can be adduced than that of Mr. Witcomb, whose interesting letter describing his experiences appeared in our last. Such a letter possesses an interest and value which cannot be overstated, as besides offering the strongest encouragement, it is full of precious hints on points of vital importance in overcoming some of the prominent difficulties. The success of Mr. Witcomb is apparent enough in this communication, but the confirmation he sends us in examples of his work is in the highest degree satisfactory. In some respects they are amongst the best carbon prints we have seen; as they possess all the delicacy, all the brilliancy, of the enamelled or glazed print produced according to M. Lambert's method, without the glossy surface which is to many persons very objectionable. Mr. Witcomb's prints have simply the fine surface given by a good rolling press, somewhat resembling that of an albumenized print, except that it is superior to the albumenized surface in possessing more ivory-like smoothness.

The great excellence to which silver printing has attained is due to the combined effort of many experimentalists and practical men, and to the fact that all threw their experience into the common treasury. That is what is especially required just now in relation to carbon printing. Our pages have during the year contained a large number of communications from practical men, and these have been read with great avidity and interest. The interest is evidenced by the fact that we have, since the issue of our last number, received many communications asking us to include two papers which appeared therein—that of Mr. Witcomb, and that of Dr. Liesegang on "Defects in Carbon Printing"—in our forthcoming Year-Book. We may say, in passing, that our little annual will contain many such articles on the subject. But we wish to urge upon all working in this direction the importance of communicating their experiences, their difficulties, as well as their successes to others through the press. That is one of the most certain modes of obtaining the fullest information, as he who communicates his successes stimulates others to describe other successes; and he who is in difficulties will appeal to many willing and able to help him. A letter in our present issue from Mr. Robinson, himself a highly successful carbon worker of many years' experience, raises a question of the first importance. He asks for the best method, for any practical method, of lowering the temperature of solutions in hot weather, to permit gelatine tissue to be worked without running. His experience confirms that of Mr. Witcomb, as to the importance of avoiding a high temperature in the first developing water,[*] and asks how it is to be avoided in very hot weather.

An appeal like this, whilst made to any who may have experience, is especially made to the Autotype Company, as owners of the whole of the patents under which carbon printing can be worked. In regard to this and some other difficulties, it were well the Company should give especial attention. It is probable that many complaints, often ill-grounded, must reach the *fons et origo* of carbon printing; but that there are difficulties which careful and experienced workers encounter which the Company are scarcely willing to recognize, there cannot be doubt.

The proposed discussion of difficulties in carbon printing at the next meeting of the Photographic Society will afford a favourable opportunity for all interested in the matter to seek a solution, or, at least, a ventilation of their difficulties. The aim in bringing the subject forward is not the reading of a paper on the subject, but its full discussion. We trust that all who can, who have experience successful or perplexing, will attend, and aid in securing, if not a solution of the question, at least a full statement of the case.

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[*] We must here correct a printer's error in Mr. Witcomb's letter in our last, where, by a transposition of the figures, the temperature is given as 58°, which should stand 85°.

NEW FACTS IN DEVELOPMENT.

The new facts brought by Captain Abney before the Photographic Society, on Tuesday night, are probably the most interesting and important, in a scientific point of view, which have been noted in connection with photography for many years; whilst in an essentially practical aspect they already possess applications of great interest to photographers.

To state the fact baldly, Captain Abney has found it possible to develop an image on a bromide of silver film which has never been exposed to light. To explain: Captain Abney takes an ordinary sensitive plate (say), one of his own albumen and beer dry plates, the sensitive film consisting of bromide and iodide of silver, and duly exposes it in the camera, or for, experiment's sake, under-exposes it. After exposure, he pours over one-half of this plate a collodio-bromide of silver emulsion, and allows it to dry, and he then proceeds to develop it after the usual alkaline manner. The uncovered film of exposed bromide and iodide of silver, being under-exposed, yields a poor, weak image; whilst that portion which is covered with bromide of silver which has not seen the light, yields a rich, fully-detailed, vigorous image. At first sight it might seem that this vigour was due to bromide of silver dissolved by the ammonia in the alkaline developer, and yielded up to the image on the exposed film beneath. But there are two curious facts which militate against this theory. In the first place, the same facts occur where the alkaline developer contains no ammonia, but in its place potash, which is not a solvent of bromide of silver. And in the next place, if the developed films are removed from the plate, and by careful manipulation separated from each other, it is found that the vigorous image is developed on the bromide of silver which has never seen the light, whilst a faint, poor image only is found on the exposed bromo-iodide film underneath it.

The discussion on the theory of the subject which was attempted on Tuesday night was at least premature, as Captain Abney remarked that the experiments he brought before the meeting were but two or three out of some hundreds, and that although he had already come to theoretical conclusions, he was not yet prepared to bring the subject in its entirety before the meeting. It will be remembered that some time ago Captain Abney communicated to our pages the results of some experiments which were similar in signification, but far different in comprehensive suggestiveness. In his former experiments Captain Abney ascertained that chloride of silver dissolved by a suitable solvent and added to an alkaline developer gave great vigour and detail to the image. In the recent experiments, however, it is to be remembered that a film is interposed between the exposed sensitive layer and the unexposed bromide of silver, in order to prevent the collodion of the latter from dissolving the underneath layer of collodion. This film may be of albumen or similar body, or it may be of a resinous nature, and it may be of non-actinic colour, without interrupting the action. The chief precaution necessary is to see that the layer is not too thick, as in such case some reversed conditions are initiated.

The light shed on the theory of photographic action, and of the nature of alkaline development, will doubtless prove of great importance. At present there is the clear practical fact, that a dry plate under-exposed or produced in a bad light—in fact, under conditions under which a weak poor image might be anticipated—may, by coating with an emulsion of bromide of silver, be made to yield a fine vigorous and satisfactory negative. We heartily congratulate Captain Abney on the successful issue of this pregnant series of experiments upon which he has been engaged, and the Photographic Society on the prospect of an early paper, detailing his experiments and conclusions at large.

MORE MEDALS AT PHILADELPHIA.

Referring to the distribution of honours at the Centennial Exhibition, it will interest our readers to learn that already two supplementary lists of awards have been issued. In the second, which appeared in the *Times* a few days ago, we find the name of Mr. Frank M. Good, as receiving a medal for photographs of Palestine. An accumulation of evidence justifies our remarks to the effect that there were at least *prima facie* grounds for surprise, if not dissatisfaction, at the omissions in the distribution of medals. In this second supplementary list we find the name of one gentleman, Mr. Erskine Nicol, whom we noted as amongst the distinguished artists who were passed over. Mr. Carbutt, the superintendent of the photographic department of the exhibition, referring to the subject in an American contemporary, expresses a similar surprise and disappointment, and intimates an intention of bringing the matter under the attention of the authorities, with a view, if possible, of securing some reparation of the omissions. With the best of intentions and the strictest aim to do justice, disappointments are inevitable in the management of enterprises of such magnitude; but in the present case the experiment of a novel method of appointing juries appears seriously to have curtailed their efficiency, and to this fact many of the omissions are doubtless attributable. Dr. Vogel, himself one of the jurors, says:—"The catalogue is perfectly untrustworthy, and as to the organisation of the jury, it is quite impracticable. I do not want, however, to tell tales out of school; I have seen many exhibitions in my time, and I have no doubt that I shall add to my experiences here. By way of curiosity, it may be mentioned that there are two American gentlemen on the wine jury who are total abstainers, and who, therefore, not only avoid wine and spirituous liquors, but condemn their use altogether."

A curious discrepancy in the record of awards also comes under our attention. In our American contemporary, and also in an English contemporary, we find in the list of medals it is recorded that Messrs. Ross and Co. receive a medal for photographic lenses. In the official list issued by the English Commissioners, from which our list was taken, we find Ross and Co's. medal awarded for *microscopes*, the only medal there recorded as awarded for photographic lenses being one to Mr. Dallmeyer. At the present moment we have no means of determining which is accurate, and can only refer to the official list as explanatory of the record in our own list.

Correspondence.

TEMPERATURE IN CARBON PRINTING.

Sir,—One of the great wants of the last twelve months has been some sound practical details of carbon printing. A great deal has been published on the process; but I for one have not been able to find all I wanted in what has been published, including the Autotype Manual. I am glad to see that you, as usual, are alive to the wants of photographers, and are printing everything that you think will be useful to the carbon printer. I find an article by Dr. Liesegang in your last number on "Defects in Carbon Printing, and their Cause," especially valuable. In the same number Mr. Witcomb states his method of chromotype printing so simply and clearly that I should like to ask him one or two questions.

Any method of printing, to be successful (professionally), must be workable, and to be relied in all the year round, Did Mr. Witcomb find his method of proceeding act perfectly and without fail last August and September? Did he never meet with what is called reticulation, nor any of the other difficulties that plague carbon-printers during hot weather?

He makes no mention of the use of ice or any of the various methods of producing cold; therefore I presume he does not use any; but if he does use them in practice, he should mention the fact in his "Hints," as they will mislead rather than guide. For instance, he recommends that the development should begin in water not above 58°*. Now, it is impossible to get down to this temperature (if it be indeed necessary for developing, which I doubt,) in summer without employing some artificial means.

I now come to what was really the object of this letter. In my opinion, and in the opinion of many others, some method of producing cold artificially is absolutely necessary in the carbon process in hot weather. I want to ask any of your readers who have had any experience in this matter whether they can give me any information on the subject of producing cold and using it? To send to the fishmonger's for a pound of ice every evening, and to use it "raw," is a very bungling method of going to work.

My question, then, is, what is the best cold producer, and how, and with what apparatus, is it best applied to the carbon process? H. P. Robinson.

PHOTOGRAPHIC FACTS AND FANCIES.

Dear Sir,—It has often occurred to me that if some of your able correspondents would occasionally contribute papers, detailing a few of the numerous incidents of an instructive or amusing character which they must often have met with during their professional career, it would tend to make the journal a still more welcome visitor amongst us, as an opportunity would thus be provided for the ladies and juniors of our family circles to obtain a little pleasure from the same source which affords us so much. Take, for instance, the letter from Mr. Ferranti, which appeared in your last issue. It is full of interest, and is, moreover, well calculated to awaken in the minds of the young feelings of respect and veneration for the aged. I well remember a similar circumstance which happened in my own experience many years since, when I also had the honour of photographing a dear old lady of the mature age of one hundred and seven years; and, let me add that, after I had taken the photograph, the old lady very pleasantly and good-humouredly implanted a hearty kiss on my cheek, at the same time invoking the blessing of Heaven upon me. I do not know if Mr. Ferranti was similarly honoured, but I flatter myself there are but few who can boast of having received a centenarian's kiss.

I was referring to the circumstance, perhaps a little proudly, a few years afterwards at a small festive gathering at that particular season of the year which brings juvenescence into a more than usual state of effervescence, when a winking wag, who was one of the party, took the wind quite out of my sails by drily remarking that it was all very nice, no doubt; but, for his part, he would much prefer receiving the same tender impressions upon his cheeks from the lips of the eighteenarians then present than from any centenarian living," saying which he cast a sly look towards the mistletoe-bough, which was suspended from the ceiling. Of course, I said no more, but simply "dried up."

Woolwich. W. Cobb.

PINHOLES.

Sir,—Having from time to time seen notices in the Photographic News of the various methods of treating a negative bath for pinholes, and having often been greatly annoyed with the same, I believe I am able to point out some of the reasons why many fail with the same kind of treatment with which others succeed. As a working photographer, with only very moderate pretensions to chemical knowledge, I cannot at present expect, as many brother photographers do, to be in possession of a panacea for the cure of pinholes. When a remedy is mentioned in the papers, it is tried by those who are in trouble with the (to some people) everlasting pinholes; and if the condition of their bath is such that it proves successful, and at the same time is more easily and quickly applied than former, and, perhaps, successful remedies, it takes the preference to others, though if the same were tried with other conditions of bath, it would fail to cure. I cannot see how one remedy can be a cure for all cases of pinholes when there are so many and such opposite causes. Take, for example, a bath that is somewhat weak of silver, and overcharged with iodide salts through overwork, which, together with a rise in temperature, suddenly gives rise to an abundant crop of pinholes. The same treatment will not answer for that as would be needed for a newly made bath that gave pinholes, because of its containing sulphate of silver, as mentioned long ago by Dr. Vogel. Each of the cases certainly requires a different treatment to bring the bath into good working order. It may be that the two causes are in operation in the same bath and at the same time; in that case a dose of nitrate of baryta would prove a remedy, for a short time, establishing a deposit of sulphate of baryta, and take with it a small portion of iodide salts. This is not a perfect cure. It will enable a few more plates to be taken, it is true; but one of the primary causes still exists. When pinholes make their appearance in the negative, the operator should not jump to the conclusion that because Mr. So-and-So has spoken highly of nitrate of baryta, and has himself proved the same to be good, that it is a panacea, but should consider what is the probable cause, and apply a remedy accordingly. Many excellent remedies for this have appeared at different times in the Photographic News, and, I believe, in the Year-Books.

The bath is not the only place to look for a remedy for pinholes. It has occurred to me that a change of collodion has produced them; but on going back to the old one all has been right again with the same bath, the cause of which I cannot account for, but certainly it was not because the collodion was unsettled or dirty.

A very prolific cause of pinholes occurred to me some years ago when working from home in a small portable dark room. In my haste I got a few drops of developer in the bath, and the plate became completely covered.—Yours respectfully, D. W. Whetton.

REST, HEAT, AND LIGHT FOR RESTORING NEGATIVE BATHS.

Dear Sir,—For four or five years I never made a new bath; but about four years ago I removed to another part of this village, where my principal light is north—it was north-east before; this caused a re-arrangement of blinds; and, with a great many small matters requiring attention, my baths were neglected, and so I got into a mess with them; and for more than twelve months everything I could think of was tried to get them into order without avail. At last I made up my mind to use a new bath as long as it would work, then throw it down, and take up another. But when busy, there was no time for attending to this; so the baths were just put aside in the light. When I came to have a little leisure, one was tried, and it worked splendidly; then another, and so on with the others. Gradually it resumed my old way of working, in which I had six baths, one of which was used every day, until it began to fail, when the *needle-like crystals* were filtered out, and a little new solution put in, and the bath was put aside in the light, and taken up in about eight days. The rest were, in succession, treated similarly. But what astonishes me now is, that I have never seen a crystal of iodide in my present baths, though they have been in use for more than two years. I may say, also, that these baths are placed alternately in the heat and light, and when they are perfectly pure, after careful filtering, say when they have been in the light, and are put into heat, a milky solution is the result; and the same when taken from the heat, and put in light, and often they both work well for a long time.—I am, dear sir, yours truly, Wm. Colquhoun.

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* This was a printer's error through transposition of the figures. It should have been 85°.—Ed.

DYED BICHROMATE PRINTS.

Sir,—I have to thank you for the article in your issue of the 6th ult. on "Dyed Bichromate Prints."

Mr. J. Perry's failure in obtaining pure whites was probably owing to the omission of citric acid in his formula, and to want of care in washing off every trace of the bichromate salt in the high lights before developing.

Regarding the use of citric acid in working in half tones, I have, since writing to you, adopted the method of flooding the print with a weak solution of citric acid after development, till the whole picture becomes somewhat faint; I then, after thorough washing, bring it up to the required tone with gallic acid saturated solution. By this mode of operating a softness and delicacy of detail is obtained, something approaching to silver prints.

I intend trying your suggestion of working by double transfer at an early date, and have no doubt but that finer results will be obtained out of the process in that way than by our present *modus operandi*. The tints of the prints can be greatly varied by slightly altering the first developer; this will be apparent to you from the specimens sent. As the prints darken in drying, discretion must be used in developing. I am sorry I cannot write more fully, but there is only just time to catch the mail, and I wish to acknowledge your notice as soon as possible.—I am, yours faithfully, C. C. Sargeant.

Survey Office, Madras, Nov. 16th.

SHORTENING OF EXPOSURES IN PORTRAITURE

Dear Sir,—I do not know whether any of your readers have tried the shortening of exposure in the manner I am about to describe, which is very simple. It is merely placing a gas jet underneath a thin brass plate, size 8½ by 6½, which requires to be lighted a few minutes before exposing, to thoroughly heat the plate. The iron is poured on (or the developer used) previously to placing the sensitized plate above the heated apparatus; and I can confidently assert that it will shorten the exposure considerably more than the secret that was offered last winter to photographers at the price of £2 2s.—Respectfully yours, Elwood Terry.

Proceedings of Societies.

Photographic Society of Great Britain.

The usual monthly meeting was held in the Water Colour Gallery, Pall Mall, on the evening of the 12th inst.; Mr. J. Glaisher in the chair.

The minutes of a previous meeting having been read and confirmed, Mr. F. D. Barrows and J. D. Colton were elected members of the Society.

Captain Abney, F.R.S., exhibited some transparencies to the members, and briefly brought before them some new facts in connection with alkaline development. The first plate exhibited was produced on a sensitive dry plate, prepared by the albumen beer process. This plate, after exposure, was partly coated with a bromide of silver emulsion. The uncovered portion gave a poor, weak image, whilst that coated with emulsion was full of vigour and detail. If the two films were split, the most vigorous image would be found on the upper one, which had not been exposed. Some time ago he had mentioned in a communication to the News that chloride of silver, when dissolved in a suitable menstruum and added to the alkaline developer, gave the image great density.

Herr Warnerke asked what was the film interposed between the two sensitive layers to prevent the upper one dissolving that first applied. These experiments would aid in determining whether the photographic action was physical or chemical, and the nature of the film.

Captain Abney had used various substances; albumen, for instance. He separated the two films which had been in contact, and then developed; and that which had not been exposed showed no trace of action. He believed the action to be both chemical and physical.

Colonel Wortley referred to the fact that markings on a dirty plate would develop at the same time as the image of an exposed plate.

Captain Abney said that was a totally different thing.

Mr. England asked if the action was not dependent on the exposed plate obtaining silver from the emulsion?

Captain Abney said undoubtedly it was due to silver being obtained; but the chief image was in the unexposed film.

Mr. Hughes suggested that the fact discovered by Mons. Marion, in carbon printing, that an exposed tissue set up an action in an unexposed tissue, was analogous.

Captain Abney said no; for if the films were separated after contact, and before development, there was no action manifest on the unexposed film at all.

Some further conversation, in which Mr. Sebastian Davis, Mr. Spiller, Herr Warnerke, Captain Abney, and the President took part, closed the subject.

Captain Abney read a paper on the "Photographic Operations of the Arctic Expedition," which will appear in our next.

Some conversation ensued on the marvellously low temperature at which it was found photographic action was possible. After a vote of thanks to Captain Abney,

Mr. Maddesley read a paper on "A New and Simple Method of Working in the Field," which consisted in a method of preserving plates moist, and of a simple means of carrying such plates, and developing them in the field without the usual paraphernalia of the wet process. An exposed plate, which had been prepared three weeks, was developed in the room, but fogged through the presence of too much light. Details in our next.

After a brief conversation,

The Chairman announced that the next meeting would be devoted to a discussion on carbon printing, at which Mr. Fry would open the discussion. He wished the members generally a Merry Christmas and Happy New Year; and adjourned the meeting until January 9th, 1877.

Edinburgh Photographic Society.

An ordinary meeting of this Society was held in 5, St. Andrew Square, on the evening of Wednesday, the 6th inst.

Mr. John Lessels, the newly-elected President, on taking the chair, said that he had some doubt as to what had induced the members to honour him by the appointment of President of the Society. He was sure that there were many in the Society of much larger experience, and who had done much more and better work than he had any pretensions to; but if, in lieu of that, they would take a love for the art, and a strong belief in its usefulness, he would gladly undertake the duties and responsibilities, as well as the pleasures, of the office. He heartily thanked the members for the great honour they had conferred on him, and assured them that he would do all in his power to help to keep up the reputation of the Society, and make it what it ought to be, one of the first societies in Great Britain.

The minutes of the previous meeting were then read and approved, and Messrs. John Dick, George Hastie, George Robertson, David Wishart, and James Rae were admitted ordinary members.

Mr. Yerbury read a page on "The Aims and Objects of Photographic Societies, with suggestions for increasing the prosperity of our own" (see page 589.)

Mr. Vernon and Mr. Pringle highly approved of the suggestion made by Mr. Yerbury, and thought such a presentation would be of much benefit to the Society.

Mr. Dobbie heartily concurred with Mr. Yerbury. The great aim of the Society should be the encouragement of photography, and £12 or £15 spent on the presentation print from the finest negative that could be obtained would not only help to do that, but would also add to the popularity of the Society.

Mr. Sinclair was glad to see that the idea of accumulating money to build a hall had been abandoned; or, indeed, the idea of accumulating money for any purpose. So long as they kept a balance at the bank of £40 or £50 pounds, he thought the annual income should be expended on the work of the Society, and he was sure that the annual presentation of fine prints would be a move in the right direction.

Dr. Thompson had some doubt as to the benefit likely to be derived from the suggested presentation. His own belief was that the work, or true aim of the Society, should be more practical, and that a large membership was really of less importance than that all should be real workers.

Mr. **Tunny** agreed with Dr. Thompson, and thought that the scientific and technical aspects of photography should receive much more attention. The great object of the Society should be the production of good practical papers on those subjects and he thought some money might be well spent in giving medals or cash inducements to first-class men to bring them before the meetings.

Mr. **Macbeth** seemed to think it well to begin at home, and suggested that the work of the members should be brought to the monthly meetings, and critically examined, and that such as was of superior excellence might be bought either for the album or for distribution.

Mr. **Annan**, evidently of a more social disposition, did not see that the Society should be turned into an "art union," and thought much more good might be done by spending a portion of the funds on the promotion of social meetings.

Messrs. **Douglas**, **Turnbull** and others indicated approval of the proposal, and it was remitted to the Council to consider and report.

Several questions from the box were then discussed, the most interesting being "What is the best method of printing from a broken negative?" Various methods were suggested, probably the most satisfactory being that proposed by Mr. Bow, to cement the pieces to a plate of glass with Canada balsam, taking care that the broken edges are brought into optical contact by the balsam.

Mr. **Tunny** said that he succeeded admirably by arranging the broken pieces on a plate of glass of the size of the negative, film side up. Then floating a piece of thin albumenized paper (face up) on water till it became tacky, and pressing it firmly against the negative. The paper should be large enough to fold over for a quarter of an inch on the opposite side, and it will, as it contracts on drying, so bind the broken parts together that, in suitable light, prints may be got quite free from any indication of the fracture.

A number of very fine photographs, contributed by Mr. James Howie, were then balloted for, and Lieut. Gilbert laid on the table for inspection a volume of excellent photographs taken during the recent voyage of the *Challenger*, which were much admired.

After the usual votes of thanks, the meeting adjourned.

West Riding of Yorkshire Photographic Society.

The ordinary meeting of the above Society was held at the Commercial Hotel, Bradford, on Monday the 4th inst. Mr. **Smith**, the President, in the chair.

The minutes of the previous meeting having been read, and confirmed, Mr. **Huddick** was elected a member of the Society. the **Secretary** read a paper on "Albumen," being a communication from Mr. Clark.

Mr. **Sachs** said he had used plates coated with a substratum of albumen for years, and he entirely differed with Mr. Clark on the subject of albumenized plates injuring the bath; he had never had any failures with them, and he did not clean the backs except in the case of very large plates.

Mr. **Smith**, Leeds, stated that he had been for some time using dried albumen for making the solution, and had found it to be equal to the fresh albumen from a new egg.

Mr. **Howarth** was of opinion that for amateurs albumenizing plates was not advisable; he had found that albumenized plates would not keep any length of time, and that he could clean the plates he wanted quicker and more certainly than he could albumenize them. He had coated plates with albumen and laid them aside for a month, and on coming to use them found them entirely worthless; cleaned plates under similar circumstances were successful.

Mr. **Smith**, Halifax, had met with similar experience to Mr. Howarth's.

Mr. **Wormald** spoke favourably of the use of albumen, his long exposures, after one to two hours, compelled him to use it; otherwise in the after-manipulations the film rose. He was of opinion that the albumen had no deleterious effect upon the nitrate bath, and he wiped the backs of none except 26 by 21. If the plates were albumenized he always felt certain of the result. It was often his lot to work under disadvantageous circumstances. He remembered on one occasion when in the North of Scotland, having used up his stock of albumenized plates, and being miles away from any town, he had to content himself with rubbing them with a cloth dipped in nitric acid, kept for bath purposes, rinse them under the water of a mountain spring, albumenize and dry out of doors, and the plates were equal to anything he had done. As the film sticking on the plate, on one occasion when photographing machinery in Wiltshire, he washed his plates under the hose pipe used for washing the engines, a force that would have completely washed off the film from a simply cleaned plate.

Mr. **Smith** (Halifax) remarked that some samples of collodion stick better to the glass than others; he had some that could scarcely be rubbed off.

Mr. **Greaves** thought that if Mr. Smith's baths were acid he would not find the collodion stick so well.

Mr. **Smith** replied that as he used Black's acid formula for his bath, Mr. Greaves' remark could not apply.

After some further remarks the subject of albumenizing plates dropped.

Mr. **Greaves** remarked that if Mr. Clark's statement that a high gloss on paper was secured by the use of albumen which had undergone fermentation was correct, that was probably the reason of the want of permanency so much complained of, and which was attributed to the albumen.

Mr. **Smith** said that Mr. Cherrill, in a recent communication to one of the journals, corroborated that statement.

The meeting then became of a conversational character, and shortly afterwards adjourned.

Liverpool Amateur Photographic Association.

The annual meeting of this Association was held on Thursday, the 30th ult., at the Free Library, William Brown Street, the President, Mr. W. **Atkins**, in the chair.

The minutes of the previous meeting were read and passed. The Secretary then read the following

Annual Report.

Our Association has completed its thirteenth year, without showing any falling-off in its prosperity. During the past year few papers have been read, but the interest of the meetings has been sustained by short descriptions and examples of work produced by a variety of processes, which have been experimented upon by different members. It is unfortunate that we have not more facilities for giving practical illustrations of the methods of working at our evening meetings, as, whenever such demonstrations are announced, much larger attendances of the members have been the result. It is satisfactory to see that the members, instead of, as formerly, confining themselves to one process, are experimenting and working many of the various processes suitable for out-door photography, so that we have now a better opportunity of seeing and exchanging opinions upon examples of the different descriptions of dry-plate negatives that can be produced. The wish that the presentation-print should be produced from negatives taken by one of our own members has been met by the kindness of Mr. O. R. Green, who took great trouble to produce some negatives worthy of the object. The result has been that for this and the last year each member has been presented with an autotype enlargement of a value exceeding the yearly subscription. The changing of the night of meeting has only proved inconvenient to a few members. The gelatine process has been very prominently brought forward by the Rev. H. J. Palmer, who spares no trouble in showing the details of its working. Papers have been read by the Rev. H. J. Palmer and Mr. W. H. Kirkby, and descriptions and illustrations have been given, by different members, of the wet emulsion, burnt-in enamels, carbon transparencies, and other processes. Trials have been made of different lamps suitable for the lantern, and many interesting cameras and other apparatus used in our art have been exhibited. Our album has also received several contributions, and a collection of lantern slides for the use of the members is now being prepared. Notwithstanding the heavy expenditure incurred for the presentation prints, our treasurer is able to show a very satisfactory balance.

The **Treasurer** read his report, stating that there was a good balance in hand after paying all expenses.

The undermentioned officers were then elected for the year 1877:—

President—Rev. H. J. Palmer.

Vice-Presidents—A. Tyrer and H. A. Wharmby.

Treasurer—A. Tyrer.

Hon. Secretary—William Murray.

Council.—W. Atkins, T. Clarke, E. P. Houghton, W. H. Kirkby, W. M. Pendlebury, E. Phipps, Rev. J. D. Riley, E. Roberts, W. B. Roberts, L. W. Weber, W. H. Wilson, and E. Twigge.

Laws IX. and X. were altered to—"The ordinary and annual meeting shall be held on the last Thursday in the month "—instead of "the last Tuesday," &c.

A vote of thanks was passed to the Library and Museum Committee of the Corporation for the use of the room in the Free Library.

The Rev. H. J. Palmer exhibited some specimens of retouched negatives, and some sensitised paper for enlargements.

Some discussion took place on the manner of producing certain effects with the sciopticon, during which

The Secretary stated that Mr. Forrest advised thinner glass to be used at each end of the lamp than was generally supplied with it. Mr. Forrest also recommended that the glasses should be tempered by placing them in cold water and boiling them, allowing them to gradually cool; there would then be less risk of breakage from the heat of the lamp.

The President and Mr. Knott then exhibited some transparencies by the aid of both the old and new form of sciopticon, to give the members an opportunity of comparing the merits of each.

The meeting was then adjourned until the last Thursday in January.

French Photographic Society.

A meeting of the Society was held on the 3rd November, M. Peligot, President, in the chair.

M. Chardon handed in a sealed packet to the President, to be opened at a subsequent date.

M. Davanne read the conditions of a competition for 2,000 francs to be awarded to the successful inventor of a photo-mechanical process which would permit any negative to be converted into a printing block capable of being printed in a printing press. (For conditions see News, Nov. 17.)

Some fine specimens of photography were forwarded to the Society from MM. Naja, of Venice; Jacobi, of Berlin; and Souza Fernandez, of Oporto.

M. Chardon gave a review of subjects interesting to photographers which had appeared recently in the foreign journals.

M. Scotellari gave an account of some experiments he had undertaken in lighting studios with violet rays (see p. 521).

M. Davanne made some remarks relative to the organisation of the Universal Exhibition of 1878. Photographers were requested to make an effort to render the art properly represented, as was the case in 1867. The Jury of Admission for photography, whose department is Class XII., Group 2, is composed of MM. Berthand, Darlot, Davanne, Villecholes, Heliand, Martin, Poulenc, and Rousselon.

The President distributed the medals and diplomas awarded by the jury at the last Exhibition; those who have not received their awards were directed to apply to the Secretary.

M. Janssen, of the Institute, read a paper on the importance of photography in undertaking astronomical observations. (This paper has not yet appeared, but will be published shortly.)

M. Stebbing, on his return from England, brought back a camera-stand, which he exhibited.

Dr. Fayer forwarded some micro-photographic pictures of a medical character, which he employed for educational purposes.

M. Thiel submitted some mechanical prints to the Society.

M. Franck de Villecholles showed a new portable laboratory designed by M. Terpereau.

The proceedings then terminated.

Photographic Section of the American Institute.

The usual meeting of this Section was held October 3rd, the President, Mr. H. J. Newton, in the chair. After routine proceedings,

Mr. Peter F. Weil said that as the subject of carbon printing had been before the Section at its last meeting, he would state that Mr. Kruger and himself had recently been working in that line with considerable success. Mr. Nagle, of Hoboken, has also been practising the new method. Some time ago Mr. Kurtz, of this city, worked the process, but did not continue it. In regard to the keeping qualities of the paper, he would say that in warm weather it does not work well. The paper becomes hard like dried india-rubber, and this will occur just the same whether the paper is kept in the dark or in the light. The most trouble in working carbon tissue is found during warm weather. Dr. Ott uses ice on warm days; a few pieces placed in or around the bichromate of potassium solution removes the difficulty.

The Secretary enquired if the paper had to be used on the day it was sensitized, or would it keep?

Mr Weil answered that the paper should be used as soon after sensitizing as possible.

Dr. M. N. Miller said that Dr. Ott did not claim that the paper would keep for a long time.

Mr. Chisholm remarked that Dr. Ott said that the best way was to sensitize the paper the last thing in the evening, and it would be ready for use the next morning.

The President said that at the last meeting he promised to exhibit some of the negatives he had made while in the country during the last summer. He then showed quite a number of very fine 8 by 10 negatives made with his emulsion, some of which was more than six months old when used for preparing the plates. He said he also took with him twelve plates which had been prepared about five months, and he saw no difference in the working of the old and those freshly prepared.

The President also exhibited some albumen paper which had been sensitized about eighteen months. The paper had not changed in appearance in the slightest degree, it being as white as unsensitized paper which had been albumenized about eighteen months. He also showed a print made on some of the paper that morning, which was as good in all respects as a print made on freshly prepared paper. He said there had been no pains taken to protect this paper from the atmosphere; it had been rolled up in common wrapping paper and laid in a drawer. He stated that a year ago last March he exhibited some prints made on paper which had been sensitized three months, and also some on paper which had been sensitized that morning; and it would probably be remembered by some that the prints on the old paper were quite equal to those on the new. The paper on which those prints were made was prepared the same as that which he had exhibited this evening. Many efforts have been made during the last six years to prepare a sensitized paper which would remain without change, so that it could be made a commercial article, yet at this time there is none in the market in this country. There was a sensitized paper made and sold in France for some time, but he did not think it proved a financial success. It was prepared with collodio-chloride, which made it very expensive and difficult to manufacture. The preparation of the paper exhibited is exceedingly simple. It is sensitized in the ordinary way, and as soon as drained, and before it begins to curl, the edges are wiped dry; it is then floated for about one minute, back down, on water containing one ounce of hydrochloric acid to forty ounces of water. It requires about double the fuming of paper prepared in the ordinary way. After it is more than three months old it requires a pad with ammonia on it. A very effective and convenient way is to place over the paper, when in the printing frame, a piece of cotton flannel, and on this lay another piece of flannel, which has been wetted with ammonia diluted with an equal quantity of water and pressed as dry as it can be with the hand. The cover is then put on and left for two or three minutes, and exposed to the light. Paper prepared in this way gives superior prints, especially when new. It prints with great brilliancy, and with a rich, deep colour, and gives exceedingly clear and brilliant proofs.

Dr. Miller inquired how it compared in sensitiveness.

The President replied that there was no perceptible difference in sensitiveness to paper prepared in the ordinary way.

Dr. Adolph Ott exhibited some specimens of polychrome prints which he said are now made in France. The particular colour is not put on by the brush, but is in the paper itself, forming the background. The brown colour here shown is in the paper only, but the flesh and light colour is put on afterwards. They are carbon prints, but made by a modification of the old Swan process, and are of course perfectly durable, like all carbon prints. The only difference between these polychrome and the carbon prints is that the former are on linen and the latter on paper.

The Secretary asked if these prints were not made by masking out—one colour masked over the other.

Dr. Ott said that was so. These polychromes can be made on the same press as the carbon prints. The process is patented throughout Europe, and is already in use in France, Germany, and Switzerland. Photography enters a new field by this process. These polychromes can be made by any one who can handle a brush. The paper for this process is now manufactured on a large scale, and can be had at the same price as albumen paper. He had about fifty rolls of the paper. An application for an American patent is now pending. He could instruct a person in two or three days to make as good a picture as was here shown.

The Secretary said: Now, doctor, we come to a vital point: how much is it going cost? Will it cost one hundred or five hundred dollars for a person to become acquainted with the process and have the right to use it?

Dr. Ott: About one hundred dollars.

Secretary: Now, if it will cost one hundred dollars, can a person so instructed procure the machinery to work the process at once; and if he cannot purchase the prepared paper, can he make it himself?

Dr. Ott: Certainly, he can; but it would not pay any photographer to prepare his own paper.

Secretary: There was some question about this paper not keeping; and if a large quantity of paper is on hand and it should fail, what then? It seemed to him that there would be some trouble here. Has Dr. Ott known these prints to peal from the paper?

Dr. Ott said: With the old Swan process this occurred, but with the improved method he had never seen any do so.

On motion of the Secretary the meeting adjourned.

Talk in the Studio.

The Edinburgh Exhibition.—We understand that the Edinburgh Exhibition promises to be a very decided success, both as regards quality and quantity of exhibits. So large, indeed, is the latter, that the opening night has been postponed from the 15th to the 20th instant.

The Awards at Philadelphia.—The Centennial Commission can scarcely be congratulated on the way in which it has managed things with respect to the awards. Nobody seems to know exactly what its action portends, and it looks very much as if matters had drifted into a hopeless muddle. We are loth to believe that what an American contemporary characterises as a monstrous fraud upon exhibitors and the public can have been perpetrated, and in the absence of irrefragable proof refuse it credence. But other disquieting rumours are in circulation.—*Condensed from "The British Trade Journal," December* 1.

To Electrotype Insects, Ferns, etc.—Immerse the object in a solution of nitrate of silver in wood naphtha. When partially dried, the object should be treated with ammonia, the result being a double salt easily reduced. After thorough drying, expose the article to the vapour of mercury, when the surface becomes completely metallized in a few minutes. It may then be placed in the bath, and metal deposited in the usual way.

To Correspondents.

⁂ The Year-Book of Photography.—We have to acknowledge with many thanks the numerous and valuable responses to the appeal in our last two issues to our readers for aid in preparing our Year-Book, copy of many valuable articles, hints, and suggestions having arrived, which will duly appear in our annual. We make a further appeal to those friends who have promised articles, to favour us with copy without delay, as we only await their contributions to enable us to go to press.

Brush.—An oil painting is better left, after the painting is completed, for two or three years before being varnished; and it is better left uncovered with any material. Size is a very unsuitable and unsatisfactory material for coating an oil painting. It may be rubbed with a rag dipped in linseed oil, leaving as thin a film as possible; but this will bring up the detail in portions which have dried a little dull or opaque looking. This may be sponged off with a damp sponge if, after a few months, it gets dull or dirty, and the process repeated. If you are desirous of varnishing easily after the painting is finished, use mastic varnish, which is least likely to crack or cause cracking. Copal is a harder varnish, and gives a more brilliant surface; but it is more liable to crack.

Rustic.—Litharge is quite an unsuitable material to use in cementing a bath for silver solutions. The instructions to which you refer give marine glue as the proper material; and we do not know of any other material so suitable. It binds well, and will not affect the solution. You will be able to get it at most oil shops.

W. W.—The acetate of lead and phosphate of soda may be kept in solution. 2. Citric acid is a much more powerful restrainer than acetic acid, and must be used in smaller proportions. In order to cure fog, it is important to get at its cause. The reason for using acetic acid in preference to citric in many cases is the difference in the colour of the deposit caused by the different acids. Acetic acid tends to a warm and brown deposit; citric acid to grey or blue deposit. Citric acid, used with an iron developer, gives a cold, grey, poor-looking image.

Syntax.—The general plan of the studio appears to be very good; but as only six feet of glass appear to be available for each end as side light, there is a chance of that admitting a somewhat limited amount at times. Belgian sheet glass is the cheapest, and answers, in our experience, as well as any other. The curved end to the panes of glass will involve much more trouble in cutting, and will not, we fear, answer the same purpose as the slanting end. In the latter the water, running to a point, will easily get away. In the case of the curved end, it is probable it will suck under, although not quite so much as with the straight ends. Your letter arrived too late for answer last week. We have returned the plans by post.

Bromo.—Mr. Slingsby has, we understand, recently entered a fresh specification. The first entered one is not, we believe, yet published. We hope to find time to search the records of the Patent Office soon, and will let you have the numbers, and will publish the specifications as soon as they are accessible. Thanks for paper; and thanks, in advance, for that promised.

D. F.—The use of tincture of iodine for modifying the intensity of a varnished negative is quite efficient, if properly managed. In any operation with which you are not familiar, it is wise to try first on a waste plate. We prefer tincture of iodine, because it is more manageable than a varnish containing iodine. Make a tincture of iodine by dissolving (say) eight grains of iodine in an ounce of methylated spirit. Then take the varnished negative you wish to intensify, and flood the varnished surface with a little methylated spirit, drain it off, and then apply the tincture of iodine, pouring it gently on at one corner. Allow it to remain a few seconds; pour off, and examine the negative. It should show increased density, and the image should be of an olive tint, which is very non-actinic. Again rinse once or twice with spirit, and dry before a fire. If necessary, the negative may then be varnished again; but it does not always need it. If the iodine tincture be allowed to remain on the plate too long, it will convert the image into a pale primrose yellow, which will possess a reduced, rather than increased, intensity.

Charles Waldack.—Opal glass plates of the size you require can be had in England. Houghton and Son, of Holborn, will supply it in any quantity; as will also the Autotype Company. We find it mentioned in their list as up to fifteen inches by fifteen, at 7s. 6d. per foot for the opal flashed patent plate, which is the kind suitable for developing carbon work. Thanks for interesting paper, and thanks in advance for the other mentioned.

Tyro.—The chief purpose of the various proposed additions to iron developers is to restrain the activity of the iron salt, and bring it more under control. The organic additions are intended to aid in securing greater intensity. Many of them are useful; but as a beginner, we should recommend you to stick to simpler solutions for the present.

Copyist.—All the illustrations in Dickens' works are just as much copyright as the tales themselves, and copying them without permission of the owner of the copyright would be a piracy, which would involve you in certain trouble.

G. V. W.—It is very difficult to ascertain, without superintending all the operations, whether your printer fixes the prints properly, as a print may be imperfectly fixed, and show no traces of it immediately. An intelligent supervision will, however, aid you very much. If you ascertain that fresh hypo of proper strength is made every time a batch of prints is fixed; that two batches are never fixed in the same solution; that the quantity of hypo is sufficient for the batch; that the prints are kept moving; that they are well washed before immersion in the hypo, so that no decomposing agent is introduced into the fixing solution; and that the prints are fixed in a non-actinic light; you may fairly believe that the fixing is properly conducted. A like intelligent care will, of course, be required with the washing. No system of tests can be well relied on.

G. R. E.—The formula must depend entirely upon the result at which you aim. If you want a highly albumenized surface, undiluted white of egg must be used. If you want a surface with less gloss, dilute the albumen. The addition of six grains of chloride of ammonium to each ounce will give you a paper suited to a thirty-grain silver bath. Rapid floating, scarcely leaving the paper on the solution, but drawing it rapidly over answers best.

Silver.—We regret that we cannot give you the information. We do not come into contact with dealers in mounting cards, and rarely see samples or patterns. Our correspondent is anxious to obtain black mounts for card portraits with red line, and white with broad red line. Can any correspondent tell him where they are obtained?

V. L. Jackson sends an interesting letter, mentioning that Jackson Brothers, of Oldham, were the first to use the magnesium light in photographing underground. The letter will appear in our next.

W. R. P. J.—Thanks for suggestion, which shall probably receive attention.

Proceedings of the Bristol and West of England Amateur Photographic Association in our next. The Report arrived too late for insertion this week.

Several Correspondents in our next.

The Photographic News, December 22, 1876.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Society for Photographing Relics of Old London—The Graphic Theatrical Programme—Illustrations of Iron and Steel Experiments.

The Society for Photographing Relics of Old London.—It is gratifying to learn that the Society for photographing relics of Old London is flourishing, and has published a second volume of transcripts. We have several times in these columns pointed out the importance of securing the landmarks of Old London, which year by year are disappearing from our midst, so that their shadows might remain behind after the substance has perished. There are still many holes and corners in the metropolis where the camera might be got to work with advantage, and a consultation of any archæological work on Old London will point to many places which still exist, and deserve to be rescued from their obscurity. Wych Street, we see, has already commanded the attention of Messrs. Bool, who are undertaking the photographic work, and so have some of the old houses in Drury Lane. "Lincoln's Inn Old Square" and "Lincoln's Inn Gateway" have not been forgotten, and are reproduced in all their picturesquness; and no doubt relics of an equally interesting character will follow. We should think that some quaint bit of water-life could be picked up by Wapping and Limehouse and Rotherhithe, for many of the old landing stairs and water side taverns, whose bay-windowed parlours overlook the river, are still to be seen, which, though a bit broken down and deserted, would nevertheless make famous pictures for the camera. Bits of architecture of this kind are, in fact, especially suitable for photography, and if the places are deserted and of a by-gone age, the camera has many advantages. The great complaint against photographs of streets and squares is that the places usually appear so deserted, and sometimes one cannot help thinking that it is an excavation of a buried city one is looking at, there is such an air of stillness and quiet pervading the picture. The Royal Exchange or St. Paul's is scarcely recognisable in a photograph when one sees but a couple of people standing listlessly in the foreground; there is something extremely melancholy in the picture, and the quietude of the place exercises a most depressing feeling. But with old monuments or buildings of a by-gone age such effect rather adds to than detracts from the picture, and hence we say that photography is doubly suitable for the depiction of the relics of Old London. We trust that the Society will not rest at the early stage of its labours, but that it will continue in this prosecution of such good work. The promoters may congratulate themselves on one thing, and that is the liberty to put up the camera before any of the buildings in the metropolis without asking the permission of the police in the first place; in Paris they could not do this, but would require in every instance the authorisation of the prefect before they dared secure a reflection of any building in their apparatus.

The Graphic Theatrical Programme.—For the past few years we have been hearing a good deal about processes in connection with illustrated periodicals. Not a pictorial journal has been started in London within the last ten years which has not professed to have some cheap and clever process for producing its engravings, and in five cases out of six the process has something to do with photography. As a rule, however, the processes never come to anything. They may possibly be cheap, but they are most of them villainous in execution. Many a cheap journal has been started on the strength of one of these processes, but has never got beyond a couple of numbers. However, all processes are not bad, and indeed we think that in most cases failure is more to be attributed to the worker of the process than to the latter itself. People who know nothing about photography or printing blocks take up a photo-mechanical printing process, and imagine it is going to do wonders for them. They expect far too much, and hence it is not surprising that they fail most egregiously. If, on the coutrary, they merely desire a simple transcript of a sketch or drawing made into a printing-block, the chances are they will succeed very well, and we may instance the new theatrical programme, which has recently obtained an entrance into our theatres, as affording a good example of what photography properly applied will do. The theatrical or graphic programme to which we allude is illustrated by some slight sketches of the characters of the play, rather Parisian in execution, and altogether very delicately and tastefully executed. The little pictures, in a word, possess what our neighbours would call *du chic.* They are said, too, to be produced very cheaply, and as rapidly as it takes to print ordinary programmes. To the uninitiated, their production under these circumstances is an enigma. The lines are too fine for ordinary type-printing, and resemble more steel than wood engraving, while at the same time they have all the softness and delicacy of the latter. The secret of their production, then, is this. The artist draws his sketch eighteen inches or a couple of feet in height, making use of a finely-pointed black pencil, and the original is then set up, and reduced to a very small scale, perhaps a couple of inches, by means of the camera. A very delicate image with exceedingly fine lines is the result, and from the negative is prepared a printing-block for the type press, in a way which the inventor of the process will not disclose, but which most practical photographers will have no difficulty in guessing. The main thing in the process is, however, the making use of the camera to secure pictures of so delicate a character, for, as our readers know very well, photography offers in this way a means of minimising which cannot be excelled or equalled by any other method. By employing paper with not too harsh a surface, and limpid ink, fine impressions of this sort can be printed without difficulty.

Illustrations of Iron and Steel Experiments.—The Landore Steel Company is making use of photography for illustrating the superior toughness of the metal that they manufacture in comparison with worked wrought iron. A plate of the latter is placed upon a hollow anvil, and a small charge of gun-cotton is then detonated upon it, the result being an indeutation of the metal and fractures all over its surface. A piece of steel treated in the same way did not fracture, but only buckled in a very uniform manner. Photographs of the two plates after the experiment prove more conclusively than all the talking in the world what has been the damage inflicted upon each plate, and manufacturers are able to make as good an inspection of the results as if the trial had been conducted under their own eyes.

ON THE COLOUR OF PHOTOGRAPHIC PICTURES.

BY EDWARD DUNMORE.*

The short paper I am about to read might, perhaps, be more correctly termed a series of remarks strung together on the spur of the moment, rather than a paper.

There is not the slightest doubt that it will always be a matter of individual taste as to the best colour to make our pictures, and, obviously, there will be advocates for each good tint. Nevertheless, if we principally form our judgment from pictures that have been awarded high commendation by those most competent to give it, we shall limit the area of our observation, perhaps, to some advantage.

Photographic work may be divided into three classes—portraiture, landscape, and reproductions. It is a popular idea that the colour of the photograph should be in accordance with the subject individually considered; but, unless there be an immense number of each subject required, to do so would be utterly out of the question in a business point of view, even if this opinion be a correct one—which, I think, is somewhat doubtful. To a certain degree it may be. and in *special* cases is, undoubtedly right; but, as a general rule, I am inclined to differ from it.

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* Read before the South London Photographic Society.

If we refer to pictures that have won universal approbation, we shall find that generally portraits of children and young people are made of a warmer tint than portraits of adults, and that ordinary *carte* vignette portraits are better if toned considerably past the brown stage, and made into a warm black, than if a brown colour were adopted. The larger the portrait the warmer the colour may be kept, as a much-toned large-sized portrait of the ordinary kind is invariably less pleasing than if kept of a decidedly warm tint. In carte portraiture, which forms the staple of all that is done, whatever the subject may be, save and except children's vignettes (and they frequently are better for it) should be thoroughly toned, and the brown tint entirely eradicated, as by so doing they are more generally pleasing, to say nothing about permanency, supposing the process used is silver printing.

The objection raised against much-toned portraits has been on account of the proof so toned frequently being poor and flat, and the shadows much deteriorated in brilliancy. There is no necessity whatever that well-toned prints should be either flat or poor-looking. In corroboration of this I will instance the portrait of Mr. Edge, of Llandudno; also the small composition pictures by the same gentleman, that in all probability most of you have seen, all of which will be found thoroughly toned, and the brown tint entirely destroyed, and yet they are not poor or weak in quality, but, contrariwise, they are very brilliant and effective. His aim was always to produce a colour as near as possible to that of a good engraving. As Mr. Edge is not in the habit of sending pictures for exhibition, they cannot be expected to influence photographers generally, although those who have had the opportunity of seeing them are unanimous in their admiration. It is a matter for regret that we do not have the opportunity of seeing them on the walls of our exhibitions every season.

In considering the larger sizes of portraits, the subject suggests the necessity for some deviation from the colour adopted for smaller work, and each picture will, in all probability, gain by a special treatment in this respect. As I have just now remarked, large portraits of an ordinary kind are, as a rule, best kept warm; but if the portraits be subservient to the design—that is, when preserving the likeness is not the point particularly aimed at, but the artist desires to compose a picture irrespective of it—then they, as it were, leave the domain of portraiture and become pictures (I do not mean to infer portraits cannot be pictures, but that design and composition is the principal intention), which, being in monochrome, more closely resemble the style of an engraving than that of a painting. Such photographs, then, are better if thoroughly toned, and not a vestige of brown colour left. If any of you have seen prints from such negatives, as I have no doubt you have, of the two colours, side by side, you will have no hesitation, I think, in pronouncing the thoroughly-toned ones best. These remarks also apply to copies of engravings, drawings, paintings, and everything of a similar character, none of which should be of a colour approaching brown.

With regard to landscapes: thoroughly-toned works are, as a rule, the best, and I think no landscape was ever printed that did not look better well toned than only slightly so, with this exception—that a landscape representing everything in the blaze of the rising or setting sun, with the shadows projecting *towards* the camera, will look well in either colour, and in some instances may, perhaps, be made quite warm with advantage; but such instances are rare. I have seen one or two, but they are by no means common, such times being rarely selected by the photographer for work. For any other subjects no brown tint should be left in.

Except at sunset or sunrise, all distances and middle distances are more or less grey, with a considerable amount of blue in them, and a more true representation of nature under such circumstances is undoubtedly made by eliminating any suspicion of brown from the proof. If we examine any landscape photograph where atmospheric effect is delicately and carefully rendered, the fact of thorough toning will invariably be found to be the method employed. If we take the photographs of Wilson, W. Edwards, or Bedford, we shall find this the rule most strictly adhered to. There are some landscape photographers, whose negative work is most careful and praiseworthy, who adopt such brown colours that their pictures seen for sale in the shop-windows look indifferent and unsatisfactory, merely from the colour chosen, and nothing else. They seem destitute of feeling, so to speak, and, although well-manipulated photographs, they do not give that satisfaction to the eye they otherwise would do if the colour were different.

A subject of this kind, upon which there are so many and various opinions, will, I hope, give rise to some discussion as to the advantage or disadvantage possessed by each or any method of toning.

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IRON AS AN INTENSIFIER.

BY E. BRIGHTMAN.*

It has always been to myself a matter of surprise that the subject of intensification of negatives has received so small a share of attention, for whilst modifications of formulæ for collodion, silver baths, and developers, have been introduced by hundreds, the old intensifier of pyrogallic acid seems to be universally accepted as the one and only correct thing to use.

In making a choice of intensifiers, the main object should be to select the one which gives the most uniformly good results, with a minimum of failures and difficulties.

After carefully repeated trials and comparisons of the various modes of intensification, I have arrived at the conclusion that none of them is more certain and reliable than the one published by Valentine Blanchard, many years since, consisting of protosulphate of iron and citric acid.

In appearing as an advocate of iron intensification, I am not prepared to assert that the iron gives better results than pyrogallic acid; but I think I may safely say that whilst the results are fully equal, the advantages of iron in other respects are as ten to one.

The first advantage I may claim for an iron intensifier is its simplicity in use, for when intensifying with pyrogallic acid it is a matter of absolute necessity that, after development, the plate should receive a thorough washing; on the other hand, in using iron to intensify, no washing is needed after the development; the developer being poured off, and the intensification continued, without the intermediate washing. To the landscape photographer, encumbered with a tent and working at a distance from a spring or supply of water, this is no small advantage.

The second advantage of iron intensification is the saving in time; for the intensification can be effected in less time than would be taken up in the intermediate washing when using pyrogallic acid. The saving in time thus effected will be fully appreciated by anyone who has worked in a small tent on a hot summer's day, when the air of the tent becomes almost insupportable.

The third advantage is the saving in cost. Pyrogallic acid will cost from 3s. 6d. to 4s. per ounce; protosulphate of iron 4d. per pound. Although the question of cost is one which should, I think, as a rule, be disregarded by the amateur, yet, the results being equal, preference should, I think, be given to the cheapest.

The fourth advantage is that the iron intensifier may be made in large quantities, and kept ready prepared, whereas the pyrogallic solution rapidly decomposes, and becomes useless after being mixed a few days. Especially is this the case during hot summer weather. On the other hand, the iron solution improves by keeping, for I find the longer it is kept the better it works, giving cleaner and more brilliant pictures than when freshly made; in fact, I would recommend mixing it at least a month before required for use.

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* Read before the Bristol and West of England Amateur Photographic Association.

The fifth advantage is that of cleanliness. The stains produced by iron are slight, and easily removed; while the stains of pyrogallic acid are deep, and removed with great difficulty. More especially is this the case when the pyrogallic acid comes in contact with any spot previously touched with iron solution; immediately the two come in contact ink is formed; this, together with the silver, causes stains, which can only be removed with great difficulty.

The sixth advantage of iron is that it never produces the copper coloured fog in the shadows, which, in hot weather, it is almost impossible to avoid if using pyrogallic acid.

The seventh advantage of iron intensification is that the degree of intensity may be judged of more correctly, as the colour of the deposit is less variable than when using pyrogallic acid. How common a thing it is when using the latter to obtain a negative which at first sight appears to have just the right amount of density; but, on drying, a change appears to take place, and it becomes so dense and harsh as to completely alter the character of the negative.

Again, the colour of the deposit is so variable as to greatly mislead one. At one time it may be a cold greyish tone, at another a rich brown. These differences of colour not being perceptible in the light of the dark room, lead to frequent errors, causing the operator in the former case to discontinue intensification too soon, and in the latter case to carry it far beyond the necessary point, and thus spoil the negative.

In using the iron intensifier the colour is subject to little variation, consequently the degree of density can more accurately be judged.

Last, but not least, the one great advantage of the iron intensifier is that it may be used either before or after fixing, without any preparation of the plate; whereas to intensify with pyrogallic acid after fixing, it is necessary to apply a solution of iodine to insure its action on the film. Moreover, when used after fixing, I find that fog and stains are invariably produced.

Looking at these advantages, which are so manifest, it is to me a matter of wonder that iron intensification is not more generally practised. One or two objections to its use have been raised by the advocates of pyrogallic acid, who state, first, that it will not give clear shadows; secondly, that it clogs up the fine lines of the negative; and, thirdly, that it causes stains on the plate.

To the first of these objections I can but say, that when the exposure has been properly timed, and the intensifier used in proper condition, fog in the shadows never occurs. As a proof of this statement, I exhibit a few negatives, and I think you will admit, after seeing them, that the assertion that iron intensifiers cause fog in the shadows is quite unfounded. I admit that, under certain conditions, fog in the shadows may be caused by iron intensification, but that it is an inherent defect I cannot grant. I may here point out one or two causes of fog and deposit in the shadows, and the means of avoiding it.

First, the solution, if used immediately after mixing, may cause a slight veiling of the shadows. The remedy for this is obvious—namely, to prepare the solution as long as possible before required for use. In keeping the solution a long time, I have sometimes found that a whitish fungoid substance is formed on the surface; this is common to all mixtures containing citric acid, and may be effectually prevented by adding one or two drops of carbolic acid to each pint of the iron solution.

The second cause of fog arises from using too small a proportion of restraining acid. The proportions I find most suitable are, in winter—

Protosulphate of iron	5 grains
Citric acid	8 ,,
Water...	1 ounce

In summer, the quantity of citric acid may be increased, with advantage, to ten or twelve grains.

A third cause of fog is using the silver added to the intensifier in a neutral or slightly alkaline condition. I find it works most satisfactorily when slightly acidified with nitric acid.

I think I may safely say that if the iron intensifier is used as I have directed, fog, arising from the intensification, will be a thing unknown, and that a faultless negative, in which fog does not previously exist, cannot be fogged by a proper application of the intensifier.

With regard to the second objection raised by the advocates of pyrogallic acid—namely, "that iron intensifiers clog up the fine lines of the negative"—I cannot do better than prove the fallacy of this assertion by exhibiting one or two negatives.

In the negative marked A, the fine lines representing the laths of a Venetian blind are exactly the $\frac{1}{32}$ part of an inch, and are perfectly clear, and show no signs of clogging.

Another more evident proof will be found in the negative marked B. The small cords representing the steps of the ladder are, I find on calculation, rather under the $\frac{1}{1000}$ of an inch. This clearly proves that clogging is not in any way caused by an iron intensifier.

With regard to the assertion that the iron intensifier causes stains, I can only say that no intensifier that I have ever used has, as a rule, worked so clean and free from stains as the iron. The few negatives I exhibit certainly show that, whatever may be said to the contrary, stains are not necessarily caused by the use of an iron intensifier.

In conclusion, I trust these few remarks will induce some of our members to give iron intensifiers a fair and unprejudiced trial, and feel convinced that, if they do so, pyrogallic acid will soon be discarded, and make room for iron as an intensifier.

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FILTRATION.

Filtration is one of the most common as well as most useful manipulations in pharmacy, and under some circumstances requires considerable care and skill for its successful performance. It is usually resorted to for the purpose of freeing fluids from foreign matter, and rendering them in a clear or transparent state; but in some cases it has for its object the collection of suspended substances, as precipitates, while at times both of these intentions are combined. Filtration might be considered as synonymous with straining, but, in the language of the laboratory, the former usually applies to the operation of rendering liquids transparent, or nearly so, while the latter has for its object the simple separation of the grosser portion. For the former operation, filter paper, or some spongy or porous substance, which will permit the free percolation of the liquid, and whose pores are, at the same time, sufficiently close to render it limpid, are employed. While for the latter operation, linen, cloth, flannel, hair cloth, and similar mediums whose pores are not so close as to prevent a rapid flow, are used.

Filters of unsized paper are well suited for all liquids that are not of a common or viscid nature, and are universally employed for filtering small quantities of liquid in the laboratory. Corrosive liquids, as strong acids, may be filtered by passing them through pure, silicious sand supported upon coarse fragments of glass placed in the neck of a funnel, and gradually diminishing the size upward. Granulated animal charcoal, with alternating layers of sand, forms a favourite filter where a large quantity of liquid is to be operated upon. For filtering water, the Japanese use porous sandstone hollowed into the form of an egg, and set in a frame over a vessel, into which the water drops as it percolates through the stone. The Egyptians adopted the same method for clarifying the waters of the Nile. In Spain porous earthenware vessels are manufactured, called *alcarrazes*, which are used for the same purpose. The old pharmaceutists used a cone-shaped bag of cotton or woollen, called Hypocrates' sleeve. The same contrivance is still extensively used in the clarification of syrups and viscid liquids. For the filtration of fixed oils, the conical hat-body made of felt is well adapted.

Paper filters are formed in two ways—smooth and plaited. The former is used when the separated solid substance is to be made use of, as in collecting precipitates; the latter, in cases where it is simply intended to clear the solution. Smooth filters are prepared by double-folding a circular piece of paper, with the folds at right angles, every part of the paper fitting close to the funnel. In the preparation of plaited filters, they are folded again and again in reverse directions, similar to a fan, until folded into plaits of about one inch. Care should be taken not to rupture the middle or bottom point formed in the fold. The latter are adapted to rapid filtration.

It is in most cases advisable to moisten the filter previous to passing the fluid through it, since this not only tends to accelerate the process, but also makes the solid particles less liable to be carried through the pores of the paper. The filtering paper of commerce is seldom free from inorganic substances, as, for instance, sesquioxide of iron and lime, and for this reason, when it is intended to be used for chemical analysis or manipulation of a delicate nature, it should be first freed from these substances by careful washings with dilute hydrochloric acid. The paper may be laid in a shallow dish, pouring over it a mixture of one part hydrochloric acid with about nine parts of water, and letting it digest at a moderate heat. The fluid is then poured off, and the paper is repeatedly washed with water (finally with distilled water), until litmus paper is no longer reddened by the washings; the water is then drained off, and the layer is carefully transferred to sheets of blotting paper, where it is left to dry.

The first portion of liquid that runs through a filter is commonly foul, and should be returned until it runs through clear, when it may be caught in a proper receiver. The rapidity of the process of filtration will depend upon the porosity of the medium, the extent of filtering surface, the relative viscidity or limpidness of the liquid, and the fineness of the substance it holds in suspension; the most efficient filter being produced when the first two are so graduated to the latter that the liquid filters rapidly, and is rendered perfectly transparent.

To the preceding causes that influence filtration may be added that of pressure. This process is not always advantageous, but may be used to advantage in the case of viscid liquids, which ordinarily will scarcely pass through the pores of the filter. It is employed by increasing the height of the column of filtering liquid. From the peculiar properties of fluids, by which they transmit pressure in all directions, this column need not be of equal diameter throughout, but may be conveniently contracted to the size of a small pipe or tube. The length will depend upon the degree of pressure desired. Another manner of applying pressure is by exhausting the air in the receiving bottle, the filtering funnel being fixed air-tight into the neck of the bottle, which has an opening connected with the receiver of an air-pump. Great pressure, however is in no case advantageous.

It is usually a matter of more or less importance in filtration that the filter should be kept full. To effect this requires unremitting attention, which, when the process occupies considerable time, is at least tedious. By the use of a simple apparatus, this is avoided, and the process may continue without any personal attention until completed. A bottle or jar of sufficient capacity to contain the liquid to be filtered is placed above the level of the filter; through the cork, which must be air-tight, are inserted two bent tubes, one descending nearly to the bottom of the bottle, and deep into the funnel containing the filter; the other tube terminating just below the cork of the bottle, and its extremity adjusted in the funnel at the height which it is desired the liquid shall be kept in the filter. The syphon-like apparatus is kept in working order by sucking the liquid into the longer tube so as to fill it, when it will continue to run without further attention.

There is another process of filtration besides that already described, whereby the liquid filters upwards instead of downwards. These are termed "ascending filters," and are preferable in some cases to the descending principle—as, for instance, in the filtration of heavy oils. The construction of this apparatus depends upon the same principles as the common filter, and merely requires that the feeding vessel should be higher than the upper surface of the filter.—*Druggists' Advertiser.*

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THE DIRECT TRANSFER OF PEN AND INK WORK TO STONE BY MEANS OF THE CARBON PROCESS.

BY DR. J. SCHNAUSS.*

Owing to the beautiful results which have been obtained by the aid of photo-zincographic plates capable of being printed in the ordinary printing press, photo-lithography has lately remained in the background. Nevertheless, by reason of the ease and simplicity with which the process can be carried out in comparison with other photo-mechanical methods, photo-lithography should not be forgotten, and deserves to be perfected as much as possible, although it may not be capable of producing anything but lines and pictures in white and black.

There are two methods of photo-lithography, which should be distinguished from one another :—

1. That involving the direct preparation of the stone itself with the sensitive film either with the aid of bichromate of potash and gum, or asphalte.

2. Photo-lithography which is brought about by transfer of Lichtdruck plates or chromate-gelatine paper.

The first method alone permits of the reproduction of half-tones upon grained stones, although it does not do this perfectly, as in the case of *Lichtdruck;* the process has, however, the drawback, at any rate, in the case of such photographers who are not lithographers, and therefore require the assistance of a stranger, that the stone has to be manipulated in the dark, so far as to ink the stone even—and for such work the work-room of a lithographer is scarcely suitable. On the other hand, the transfer of the photographic image from the prepared paper to the stone, and the complete production, indeed, of the former until its transfer, which may take place in daylight, can be undertaken in the photographic dark-room provided that the transfer ink, suitably thinned down with oil of turpentine, is applied by means of a brush to the bichromate image by the photographer, and by rolling and moistening by the lithographer. Unfortunately, a good deal of delicacy is lost in the transfer. A direct production of the photographic image upon the stone possesses, therefore, the advantage that the lines are better preserved, and the carbon process, as Window has shown, may be very happily made use of in this connection, permitting one to carry on the manipulations in full daylight.

This interesting process may be regarded as a supplement to the interesting pamphlet of Dr. Liesegang entitled "The Carbon Process." A glass positive is printed upon sensitized tissue, the exposure being very short, scarcely one degree of the little box-photometer with silver paper. The stone is placed in a horizontal position, and cold water poured over it; the carbon print, soaked in cold water, is then applied to the surface, the squeegee is passed over it, and after a short time the image developed in warm water in the ordinary way. The design must come out perfectly clear, and must represent but a weak negative. This is treated with alum solution, well washed, and the stone put out to dry in the most complete manner possible

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* *Photographische Archiv.*

The image must not be dried in a hot sun, as it may then lift from the stone. It is now rubbed over with thin lithographic ink, and allowed to remain for a time, so that the fatty colouring matter may have time to set and adhere to the stone surface wherever the gelatine image does not already cover it. As the gelatine image represents a negative, when this is cleared away a lithographic design of a positive will be forthcoming, the lights of which will be formed by the stone itself. The removal of the gelatine image from between the inked portions is brought about by continued rubbing with a flannel moistened in gum and water, the surface being worked carefully and evenly. I can hardly bear out the late Mr. Window's statement that no ink will attach itself to the gelatine image, for this would be altogether opposed to the theory upon which the Lichtdruck process is based, for here, as there, we have to do with a film of insoluble gelatine, which repels water and attracts ink. The thin negative film, in my opinion, simply protects the stone in a mechanical way only from the fatty ink; it likewise receives some of the lithographic ink, but this makes no manner of difference, as both the gelatine and the ink in question are easily rubbed off the stone in the manner indicated. The gum is for the purpose of preventing the ink already on the stone from being removed; there is no adhesion between the flannel and the inked portions of the stone, so that the latter remain undisturbed.

This method of practising photo-lithography, which I have many times made use of, led me to ascertain whether a pen-and-ink sketch, wood-cut, or copper-plate engraving could not be employed direct as a cliché. Experiments made with a view to determine this gave me satisfactory results, although the copies were scarcely so fine as those obtained by the aid of a glass positive. A little touching up with lithographic chalk upon the stone will overcome any unevenness. The original may also be rendered transparent, and then the printing may be conducted with increased celerity, although the copies then produced frequently lack vigour, for which reason I prefer not to meddle even with very stout paper, but to copy the design or print as it is, working to seven or eight degrees of the photometer, if need be.

This method of transferring direct carbon prints to stone, and rendering them fit for printing, has two great advantages for non-photographers. In the first place, you get your prints of the same dimensions as the original, and you have no need of any photographic apparatus. Moreover, the only knowledge required is a little information respecting the easily-learnt carbon process. At the most, a printing-frame is the only thing required in the event of your having to copy large prints.

OBSERVATIONS ON THE CARBON PROCESS.

BY DR. E. LIESEGANG.*

The phenomenon of reticulation, or incipient insolubility in the carbon film, has been recently touched upon by Dr. Schnauss, and I propose, in these lines, to show how such tissue may be employed without disadvantage—that is, if the veil has not penetrated too deeply.

The appearance of the granulation in question seems to be intimately connected with the basis upon which the image has been developed. The picture has a tendency to contract on drying, and to become smaller; and when it is prevented from doing this, from the solidity of the basis, then it must perforce remain of the same dimensions as when squeegeed before development. In this case it may happen that the continuity of the film is impaired, and then articulation sets in.

I have cut from the same roll of tissue certain pieces, and treated them in the chromate bath, and dried them under precisely the same conditions. All were exposed under the same negative, but some developed upon collodionized glass, and others upon developing paper; others, again, upon single transfer paper, and the prints upon glass and developing paper were then transferred to double-transfer paper.

On measuring afterwards accurately, it was found that the length of the mask opening in the original was 0·1055 metre; that the measurement was unaltered in the case of the picture upon the developing paper, while that on the glass had increased to 0·1063, while the picture upon the single-transfer paper had decreased to 0·1035. The last print, therefore, had become nearly three millimetres smaller than the second. It was also perfectly free from grain or articulation, a defect observable in the print upon developing paper, and very marked upon the image developed on glass.

The simple transfer process, by reason of its simplicity, commends itself over the more complicated double-transfer process, when reversed negatives are at hand, as in the case, for instance, of enlargements. I have already called attention to the circumstance that tissue which, after exposure, and before application to the glass plate, for development, is permitted to remain for a longer time in cold water than is necessary to render it flat, will give a more even and uniform picture than tissue which is only moistened for a short time. Let two pieces of tissue be applied to a glass plate (never mind whether collodionized or not); having permitted the one to remain ten seconds and the other five minutes in cold water, let them be well squeegeed, and then look at them carefully, after a little while, through the glass plate. The tissue which has been moistened but a very little while will betray a more or less number of bright looking spots, while that piece which has been well soaked will appear quite clean and free from fault. These bright spots, which are produced because the tissue has not had enough water to absorb, are not in optical contact with the glass surface, and remain in the development and finishing of the picture, militating against its effect to a considerable degree. It has been said, on the other hand, that tissue permitted to soak a long time in water will not adhere any longer to a glass or collodion surface; but for my part, I have allowed the material to remain for hours in cold water, and found no difficulty so long as the tissue, after being covered with a wax cloth and squeegeed, is weighted for ten minutes under a glass plate before being put into the warm water bath. The development I found then went on very rapidly and without any hitch. I may remark that I always provide my negatives with a safety edge, and if this does not exist it is possible, I will admit, that a tear in the tissue may occur. Five minutes' soaking in cold water is without risk, only a glass plate should be laid upon the tissue after it is squeegeed upon its developing surface.

The permanence of carbon prints has been several times doubted, and it has even been asserted that they are as fleeting even as silver prints. It is not a difficult matter, however, to find out which of the two kinds of pictures are more prone to become yellow, to change, and to blacken. One of the most serious tests is the show case, and it is also a very convenient one, which has already been made use of. M. H. Norden, of Berlin, writes to me as follows in sending a life-size portrait in carbon:—"A print from this enlargement has been hanging for three months in my show case, facing direct south, without any protection from the sun from sunrise to sunset. Till now, however, I have not remarked the slightest indication of a change of tone, or any yellowness in the whites. Other carbon prints have been hanging in the same position for a period of five months, and appear to-day as fresh as when they were first put under glass."

Another gentleman, M. Meade, of Hague, has informed me that by reason of dampness and sunshine the silver prints in his show case had been changed three times in a few months, while carbon pictures under the same conditions remained perfectly sound and fresh.

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* *Photographisches Archiv.*

The Photographic News.

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MICRO-PHOTOGRAPHS AND MEDICINE.

The employment of micro-photographs of medical subjects in the lecture-room by professors at schools and colleges is rapidly gaining ground, and both in this country and abroad we hear of such a method of teaching being had recourse to. Abbé Moigno was one of the first to demonstrate the value of micro-photography in this connection, his *Salles des Sciences* in Paris being fitted with a screen and oxy-hydrogen lamp for the purpose of showing the subjects in a magnified form. In this country several medical men have employed photography in their demonstrations, and, among others, we may mention Dr. Pritchard, Aural Surgeon to King's College; but abroad, it seems, far more use is made of the micro-camera, as witness the works of Dr. Lüys, M. Girard, and finally Dr. Fayer.

The latter gentleman has lately prepared a large series of micro-photographs of medical objects, ranging from eight to eight or nine hundred diameters. Some of these, as Dr. Fayer pointed out to the members of the French Photographic Society, to whom he exhibited his specimens, could scarcely be considered successful pictures from a photographic point of view—such, for instance, as demonstrated the penetration of the nerves up to the brain—but they were none the less interesting from an anatomical point of view, and might, indeed, be cited as one of the best proofs of what photography could do in aiding in researches of this kind.

The histologic sections, Dr. Fayer explained, were for the most part tinted with carmine before being photographed. Sometimes, however, anatomists employ chloride of gold for staining, in order to render details more visible; but when this is employed the operation of photographing becomes more difficult, and is sometimes, indeed, rendered impossible.

On the exhibition of these interesting little pictures to the Society, M. Davanne took occasion to remark upon the great development of micro-photography of late, as demonstrated by the great array of specimens shown at the last Paris Exhibition. At the same time it must be borne in mind that the cultivation of this branch of the art necessitated special knowledge and special apparatus, the difficulties attending the manipulations of these, as well as the preparation and lighting of the objects, being very great indeed. For this reason it is of the utmost importance that those undertaking such work should give their experiences to the public, because in this way only is it possible to reduce the obstacles to be encountered to a minimum.

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A BRILLIANT LIGHT.

A novel medium for burning in lamps has been proposed in Paris lately. M. A. Guillemare has communicated to the Academy of Sciences the results of some experiments made upon the resinous matter which exudes from pine-trees, and which is found to afford a very brilliant light on burning. A large extent of country between Bordeaux and Bayonne, which the traveller to the South of France passes through, is little better than a flat sandy desert, covered here and there with patches of pine-trees. This district, known as *les Grandes Landes*, affords a poor support to the inhabitants, who live mostly upon the resin collected from the pine forests, the trees being scored all over to facilitate the exudation of the *molle* or honey, as it is called, which runs into baskets fitted against the bark.

It is this *resine molle* upon which M. Guillemare has been experimenting for some time past. Two points especially required solution to render the substance, or rather the oily portion of it, in a fit state for burning in a lamp. The first was to devise an absolutely certain manner of refining the liquid, and the second to devise a special burner for the resinous oil, and both these difficulties have been met, it appears, in the public laboratory of Mont-de-Marsan, a town located in *les Grandes Landes*.

Three kinds of oil have been secured, all rich in carbon, containing respectively eighty, ninety, and ninety-two per cent. of this element. The light that is produced is remarkable for its steadiness and its whiteness, paling all other similar lights in its presence. It is, therefore, especially suitable for light-houses, and in cases, like photography, where a brilliant source of illumination is necessary. Already some important applications have been made with it, and in France, it is said, the Ministries of War and Marine are prosecuting experiments with a view to its being introduced into those services.

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Critical Notices.

THEBES AND ITS FIVE GREATER TEMPLES. By Captain W. de W. Abney, R.E., F.R.S. Illustrated with Forty Large Permanent Photographs by the Author. (London: Sampson Low, Marston, Searle, and Co.)

In the autumn of 1874, Captain Abney arrived in Thebes, in charge of the photographic operations in observing the late transit of Venus; and during the prolonged stay, rendered necessary by the various preparatory arrangements, he acquired opportunity for a systematic study and careful photographic record of those architectural wonders of the world. The handsome quarto volume before us is the result. It does not fall within our province in these pages to enter into an examination of Captain Abney's literary labours in depicting these grand mementoes of the early home of science and civilization. Sufficient to say that it is done with a loving hand, and a full feeling of the colossal grandeur alike of the conception and execution of the stupendous works, every record of which seems to stir the imagination with fresh wonder. Of the illustrations we must especially speak; and we may remark that for the first time justice has been done to the great monuments which have defied the erasing hand of time, and outlived almost all the works of man. Egypt has been a favourite playground for the photographer. Photography seems, indeed, pre-eminently fitted for the pictorial record of every detail of these wondrous ruins, which it can produce with a fidelity which would sorely task the most conscientious artist. And Egypt, its temples and tombs, have received much justice from many able photographers. But for the first time Captain Abney presents the photographs in a permanent form which shall possess some harmony with the imperishable monuments of which they are the presentment. The photographs, which are ample in size enough to render all detail satisfactory, are not only excellent in all technical points, but are seized in such aspect of light as may give them their most poetical and pictorial rendering. Altogether we congratulate Captain Abney on the completeness of his monograph and the rare excellence and beauty of his illustrations, which combine to produce a volume which in itself would present a sufficient justification of his visit to Thebes, apart from his important services in connection with the transit of Venus observations.

MEN OF MARK: Photographed from Life by Lock and Whitfield, with Brief Biographical Notices by Thompson Cooper, F.S.A. (London: Sampson Low, Marston, Searle, and Rivington.)

The publication of the portraits of men of mark is probably the most popular idea in connection with photography; as, indeed, it has been in connection with every possible form in which portraits could be published, from the earliest periods. Hamlet complains of the eagerness with which his uncle's, the king's, "picture in little" is bought up at prices which would astonish and gladden the portraitist of this day, reaching "twenty, forty, and an hundred ducats apiece!" Since the introduction of photography many hundreds of thousands of portraits have been published; many series have been issued in form something like that under notice; but the handsome volume before us contains incomparably the best examples we have seen. In all cases where we can apply the test of personal knowledge, the portraiture is admirably characteristic. We may especially instance the portrait of Captain Burton, in which the firm, squarely cut features, the keen, resolute expression, the deep sabre scar on the cheek, the aspect of force and determination, tinctured by gentleness and culture, are rendered to the life. In every instance, the technical and artistic qualities are admirable, and although there is slight retouching in the negatives, it is only sufficient to correct the exaggerating coarseness of photography. The printing is effected by the Woodburytype process, which has now attained a stage of perfection in which the results are indistinguishable from the finest silver prints, and have, of course, the added advantage of permanency. The selection of the foremost men of the time is excellent, and the descriptive sketches brief, graphic, and sufficient.

ENGLISH CELEBRITIES IN THE 19th CENTURY. Part I. (London: Hughes and Edmonds.)

This is another handsome volume of photographic portraits, but somewhat different in character to that we have just noticed. Instead of a series of individual portraits, we have here a series of groups of men associated by some common aim, consisting of "orators, statesmen, authors, novelists, artists, philosophers."

In the first group we have Lords Beaconsfield, Salisbury, Cairns, and Derby, Sir Stafford Northcote, and Mr. Gathorne Hardy. In the second, Lords Granville, Hartington, and Selborne, and Messrs. Gladstone, Bright, Lowe, and Forster. The third contains Dickens, Thackeray, Carlyle, Macaulay, Lytton, Wilkie Collins, Froude, A. Trollope, and George MacDonald. In the fourth, we have Ruskin, C. Kingsley, J. S. Mill, Darwin, Herbert Spencer, and, curiously, Charles Lamb, who would, we imagine, have felt much more at home in the preceding group. Finally, we have Faraday, Brewster, Huxley, Wheatstone, and Tyndall. Whilst the portraits have a photographic basis and the prints are produced by photography, it is manifest the grouping is the work of the painter, who has accomplished his work with much skill, both as regards likeness and artistic composition. There are brief biographical notices to each portrait. The volume is handsomely got up, and contains a group of the Queen, the Prince of Wales and the Princess, and her eldest boy, glazed in the front of the cover.

LETTS' DIARIES FOR 1877. (London: Letts, Son, and Co.)

The variety and excellence of the diaries sent out by Messrs. Letts seem steadily to increase. We have before us rough diaries interleaved with blotting paper, for handy use in the desk; the clerical tablet diary; commercial or office diaries; and a variety of pocket diaries, card case diaries, and others. The long recognized claim of Letts' diaries, which has secured their universal popularity, is trustworthiness in information, and a knack of giving even in the smallest sizes the right information, that is, the information most likely to be wanted. They are also in all respects well got up.

INSTRUCTION IN PHOTOGRAPHY. By Captain Abney, R.E., F.R.S., &c. Third Edition. (London: Piper and Carter.)

It is only necessary to announce that the third edition of this excellent manual is ready, and that it is illustrated with a pretty sylvan scene in Windsor Forest, by Captain Abney, printed by the Woodbury process.

FRENCH CORRESPONDENCE.

International Exhibition for 1877; Preliminary Arrangements; Mode of Choosing the Jury—Social Reunions among Photographers—Annual Dinner of the French Photographic Society—Vidal's Carbon Manual, a Work Illustrated by Photochromie.

The forthcoming Universal Exhibition is just now in everybody's thoughts throughout the whole phalanx of photographers. Never has an event of the kind produced such a profound impression so long beforehand, and, if one may judge by the general enthusiasm, it is certain that the new art will never have been so well represented as at the Paris International Exhibition of 1877.

Paris photographers, who, as a rule, are careless enough of such matters, seem for once to be jealously watching their interests, and, so far, the measures that have been taken offer sound guarantees to all. The Committee of Admission has been constituted in such a way that not in one single instance is it possible to take exception to its members. Besides the four members of the French Photographic Society, there are three members of the Chambre Syndicale of Photographers, and one from the Chambre Syndicale of Manufacturing Chemists. Questions, both of a professional and industrial nature, will be treated, therefore, by competent persons. But this is not all. Once the applications have been sent in and the exhibits admitted, it will be for the exhibitors themselves to elect a committee of awards, and also of hanging, for with this second body will be left the disposal of the pictures and the decoration of the photographic gallery. The cost of this will be divided among the exhibitors proportionately to the space they occupy. The General Administration are perfectly alive to the fact that where so many interests are at stake it is necessary that the delegates engaged in directing the work should be elected in a most liberal manner. Their number will be proportionate to that of the exhibitors in each class, and to them will be joined, to bring them in close contact with the Administration, some members of the Committee of Admission. Such a system will, no doubt, give universal satisfaction.

The details connected with the organization of the Exhibition have been elaborated and drawn up by the Chambre Syndicale of Photography, at their ordinary monthly meeting on the 12th of December last. The subject was broached, too, of sending a circular, which is to be addressed to all photographers in the name of the Chambre Syndicale and the French Photographic Society. This is to be signed by MM. Berthaud and Davanne, and will convey the information which we have just given. It was also announced at the same meeting that the Direction of the Exhibition was not disposed to give to anyone the monopoly of photographing the objects exhibited throughout the whole of the building and the park, but that any photographer would be privileged to do so under certain specified regulations. This is an important point to have settled, and the announcement when made gave great satisfaction.

Several of the photographic societies of England have been accustomed to meet at an annual dinner, where not only does good fellowship reign among brethren of the craft, but also many pleasing and useful experiences are exchanged. It is with much pleasure that we see the Parisian photographers following so good an example. It is now a year ago that one of the *doyens* of photography, M. Truchelet, vice-president of the Chambre Syndicale, conceived the idea of bringing about one of these fraternal meetings. Since then three dinners of this kind have taken place at the Palais Royal. The last took place a few days before the last monthly meeting of the French Photographic Society, and had the effect of bringing together many disciples of the art. Photographers should never neglect opportunities of meeting together in social intercourse, and thus communicating to one another ideas and experiences to their own common good.

M. Leon Vidal has just completed the third edition of his treatise on carbon printing, which will appear in a few days. The author, who for the past two years has practised this method of printing upon a vast scale, has made so many additions to his book, that it may be considered in the light of a new volume. It contains all the experiences that result from daily acquaintance with the manipulations, and those resulting from the double necessity of printing in large numbers, and at the same time doing so in the surest and most economical manner. For these reasons the "Traité de Photographie au Charbon" should be regarded as a very competent authority in printing in permanent pigments, and it cannot do otherwise than contribute a good deal to our progress in the art of carbon printing. M. Vidal has added to this volume some very remarkable specimens, of which one is by the photo-chromic process, and printed in colours.

The publishing firm of the "Moniteur Universel" has also published another work of M. Vidal, but of a totally different nature to the preceding. It is a magnificent album, folio size, composed of twelve leaves, each containing a charming poem by Francois Coppée, framed in a ravishing design by Giacomelli, and treating each of them of a month in the year. The impressions, which are in various colours, have been printed by the photo-chromic process, and they surpass in fineness and modelling all that the most perfect steel engraving, could yield. Copied from the original sketches themselves, they have all the charm and all the value of these. This splendid work, which has for its title "The Months," has, moreover, a merit which all the world will appreciate, and that is cheapness. Thanks to the means by which it has been produced, it can be sold by the publishers at a very moderate price. So far as regards ourselves, however, it represents a victorious application of photography, and of new printing methods adapted to the library of *luxe*. Ernest Lacan.

FURTHER PARTICULARS OF THE LEAD-INTENSIFYING PROCESS.

BY DR. J. M. EDER AND CAPT. TOTH.*

The Action of Reagents upon a Film Intensified with Lead.

4. *Chromate of potash* leaves ferrocyanide of silver unchanged, and produces chrome yellow with the ferrocyanide of lead. The white lead image, therefore, becomes yellow. Upon this reaction depends our second intensifying method. Such a chrome-lead negative, contains, therefore, chromate of lead and ferrocyanide of silver. By treatment with hyposulphite of soda and cyanide of potassium it becomes a little thinner, but otherwise does not alter in aspect, for only the silver is dissolved. Caustic potash or soda only dissolves the chrome yellow. With chloride of iron it becomes intensely green, as the ferrocyanide of silver is converted into chloride of silver, while Prussian blue is at the same time produced, which gives a green with chrome yellow. (The green colour passes to brown on addition of permanganate of potash). A solution of chloride of copper acts in the same way with the production of a copper-red ferrocyanide of copper, and a mixture of nitrate of uranium and salniak, which has the characteristic colour of ferrocyanide of uranium. In both these cases it is only the ferrocyanide of silver, and not the chrome-yellow at all, that comes into play. Iodide of potassium solution colours the light-yellow chrome-lead plates a deep yolk-yellow. Iodide of silver and iodide of lead are produced, the latter being capable of removal by thorough washing.

5. *Permanganate of potash* rapidly makes the whitelead picture a dark brown, and such an image is not changed by the action of chloride of iron. If the permanganate solution is strongly acidified with acetic acid, the negative becomes much thinner than if a neutral solution is employed.

6. *Iodide of potassium* forms, in the first place, the required iodide with the ferrocyanide of silver, but in a short time the ferrocyanide of lead is also converted into iodide of lead, the negative becoming of a very bright yellow, which pales after exposure to light for some time. Concentrated iodide of potassium solutions colour the image of a whitish-yellow, and partly attack it. On washing away the iodide of potassium solution, the image becomes dulled. The film becomes of a bright yellow, and from the suspended iodide of lead adhering to the image, the latter gets fogged. Hyposulphite of soda dissolves the whole of the image, salniak only the iodide of lead; caustic ammonia colours the picture white under formation of ammoniacal iodide of lead and solution of ferrocyanide of silver; alkaline carbonate and sulphate also make the picture white; permanganate of potash browns it. Concentrated solutions of silver turn iodide of lead into iodide of silver.

7. *Sulphate of iron* forms with ferrocyanide of lead a lead picture of sulphate of lead; at the same time the picture assumes a bluish tint, and on exposure to air becomes a rapidly dark or Prussian blue.

8. *Sub-iodide of iron and sub-chloride of iron* behave as the foregoing under formation of iodide of lead and silver.

9. *Chloride of iron* colours the white lead image a deep blue under formation of chloride of silver, chloride of lead, and Prussian blue; permanganate of potash browns the blue picture.

10. *Chloride of sodium* solution converts ferrocyanide of lead slowly into soluble chloride of lead, and for this reason a lead image is much weakened in a salt solution; chloride of silver is also soluble to a considerable degree in chloride of sodium.

11. *Chloride of copper* colours the lead picture of a reddish-brown, the same reaction as No. 9 taking place.

12. *Sulphate of copper* brings about the same colouring of the film as the foregoing, although the reaction is not altogether the same; whereas in the previous case chloride of silver, chloride of lead, and ferrocyanide of copper are formed; in this case the ferrocyanide of silver remains intact, and only the ferrocyanide of lead is decomposed with the sulphate of copper, and forms sulphate of lead and ferrocyanide of copper.

13. *A mixture of sulphate of uranium and salmiak* (chloride of ammonium) colours the lead image brownish-red (ferrocyanide of uranium). Hyposulphite of soda only deals with the chloride of lead and silver in these plates, and leaves the pure metallic ferro-cyanides.

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* Concluded from page 593.

14. *Chloride of cobalt and sulphate of cobalt* colour the lead picture green; the colour becomes gradually reddish-grey. Chloride of nickel and sulphate of nickel bring about a greenish colouration.

15. *Chloride of mercury* does not change the appearance of the white-lead image, but the density of the latter is increased by treatment with this compound. In this case an insoluble white ferrocyanide of mercury is formed.

16. *A solution of iodide of potassium*, saturated with iodide of mercury, renders the image an intense orange yellow. Iodide of silver and iodide of lead are formed, and iodide of mercury is precipitated; it is probable also that the picture contains ferrocyanide of silver. The image is exceedingly thick, and by subsequent treatment with sulphate of ammonium becomes black and more solid. This reaction, therefore, might be used as a very suitable intensifying process if the negative did not contain quicksilver, an element objected to in the film.

17. *A mixture of sulphate of copper and bichromate of potash* yields a reddish-brown colouration, similar to that which is produced by the treatment of a yellow chrome-lead image with chloride of copper. In the first reaction there is, however, less ferrocyanide of copper formed than in the last, for in one case the ferrocyanide is yielded from the ferrocyanide of silver, and in the latter from the ferrocyanide of lead, which is present in greater quantities.

18. *Concentrated silver solutions* (from 1 : to 8 to 1 : 10) slowly convert the image into ferrocyanide of silver, while the lead passes into the solution as nitrate of lead. The picture, now consisting of ferrocyanide of silver, becomes converted, on treatment with chloride of sodium, into chloride of silver, and may then be reduced to metal with an alkaline developer. In this way it is possible to intensify with silver by a chemical process, but the same, although as successful, takes longer to carry out.

Stripping the lead-intensified film from the glass.—One disagreeable is inherent to the lead intensifying process which, although to many of no importance, should, nevertheless, be mentioned: it is the tenacity with which the film, after being intensified with lead, adheres to the surface of the glass. Long and tedious experiments have shown us that the rubbing of the plates with wax, glycerine, castor oil, paraffin, tallow, and other similar materials, does not admit of the stripping of the film when dry. Such substances only aid in so far as they bring about a better cleaning of the glass when employed in an alcoholic or ether solution.

A preliminary coating of this normal collodion (half per cent. of pyroxyline) or, better still, of leather collodion (half per cent. of pyroxyline and a few drops of castor oil for every 100 cubic centimetres of collodion) together with a 2 per cent. solution of india-rubber in benzole, proved to be of some value. Glycerine cannot be substituted for castor oil in this case; it is worse than normal collodion alone, and rather adds to the difficulty of stripping than otherwise. A plate, however, prepared in the way we have mentioned, coated with collodion, sensitized, developed, and intensified, may be freed from its film by means of gelatine or leather collodion as easily as possible.

As a very convenient method, we recommend the following, in which the well-known and oft-recommended employment of dilute acids for aiding in the removal of the film is made use of. There need be no fear that the dilute acids will attack the blackened lead image if the negative is carefully washed after treatment, so that the acid shall not dry on the film, for the continued action of light and air might otherwise exert a bleaching effect. Acidifying, before the pouring on of india-rubber solution and leather collodion or gelatine, does not always help. Over the intensified negative is poured a 2 per cent. solution of rubber in benzole, and, after drying, this is succeeded by a coating of leather collodion (containing 3 to 4 per cent. of pyroxyline and 2 to 3 per cent. of castor oil). When the latter has also become dry the margins of the clichés are cut through, and the plate is put in water containing from 5 to 10 per cent. of hydrochloric or acetic acid. In a shorter or longer period the film will leave the plate with great ease, and then the same is washed and put away.

A solution of gutta-percha in benzole, which has also been proposed for this purpose, sometimes dries dull and sticky, and for this reason we always prefer to use rubber. Gelatine or gum are neither of them good substitutes for rubber as a protection to the cliché against the action of the leather collodion, and they have, moreover, the disadvantage of dissolving in the acid bath, and thus ceasing to be a cement between the leather collodion and the negative film.

The stripping of the films by the aid of gelatine alone, by pouring warm gelatine solution (usually containing glycerine) over the negative, or pressing thin sheets of it upon the cliché, we cannot recommend for negatives intensified in the manner we have described, the collodion film of which adheres very firmly to the glass, for it is impossible, when once the gelatine is applied, to make use of the advantageous acid bath. If, however, the photographer proceeds as we have indicated, and has the patience to permit the plates to remain in the acid bath until the film leaves the glass, he will experience no difficulty whatever in carrying out the operation of stripping.

ON THE REDUCTION OF BACK PRESSURE IN THE OXYGEN MACHINE.

BY W. NOTON.*

When filling a gas-bag with oxygen in the ordinary way, the gas coming from the retort to the washer and from there to the bag, need not meet with a greater resistance than is due to the depth of water in the washer, the friction in the pipes, and, perhaps, some stiffness in the material of the bag itself. The washer need not have a depth of more than three inches of water in it, so that, if we take the total back pressure in the retort to be equal to four inches of a column of water, we shall about know the worst. In the ordinary oxygen machine, as used for constant work, and having a gasholder two feet deep, the back pressure in the retort will be not less than twenty-four inches, or six times more than in the gas-bag retort. Whether this increase of resistance is any impediment to the liberation of the oxygen from the chlorate of potash or not, I cannot say; but there will be a greater liability to the leakage of gas at any joint accidentally not quite air-tight.

To reduce the back pressure in the machine retort to something like what it is in the gas-bag retort, I have made an addition so that I can fill the gas-holder now just the same, or nearly so, as if it were a bag. On the pillar tube carrying the retorts a side branch outlet is fixed having a stopcock on it; a piece of india-rubber tubing connects this branch to a Woulfe's washing-bottle placed a short distance down the outside of the cistern. Another piece of tubing connects the outlet of the washer to an inlet (also provided with a stopcock on the top of the gas-holder). With this exception, the oxygen machine remains unaltered.

When the gas from the plug in the retort begins to come over, it may go down the long tube to the bottom of the gas-holder against the column of water in the cistern, and escape as usual; or if the two stopcocks be opened it will pass through the washer and into the gas-holder above the surface of the water inside, the pressure being considerably less that way.

If we suppose the gas-holder to be weighted to give a pressure of four inches, and the water in the washer to be two inches deep, the back pressure in the retort will be about six inches, instead of twenty-four inches, or only about half as much more as was supposed to be in the gas-bag retort.

By adopting the glass Woulfe's washing-bottle the bubbling of the gas can be seen much easier than can the sound be heard at the bottom of the cistern, especially if there be any other noises about.

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* Read before the Manchester Photographic Society.

Correspondence.

PHOTOGRAPHY UNDERGROUND.

Dear Sir,—I have read with much interest the recent articles and correspondence on the above subject.

I believe that Messrs. Jackson Brothers, of Oldham, were the first persons who ever attempted to take views of the workings of a *coal mine* through the aid of magnesium wire

In May, 1865, my father and uncle, at the request of a member of the Manchester Geological Society, descended the Bradford Colliery, Manchester, for the purpose of testing the capabilities of the magnesium wire (which had then been but lately invented), and obtaining views of the workings. They were accompanied by Mr. Livesey, of the Geological Society, and others. Four negatives were taken by the ordinary wet-plate process; and although they succeeded in getting only moderate results, I believe, if the smoke from the wire could have been conveyed away, better results would have been obtained. The plates were exposed from six to seven minutes, and had it not been for the smoke they might have been exposed much longer, as they were not affected by the temperature; the greatest difficulty which they had to contend with was that, when the wire had been burning for six or seven minutes, it sent forth a dense smoke, which at once filled the mine (notwithstanding the efforts of the miners to force it away), and prevented further exposure of the plates.

I send you four copies from the original negatives for your inspection. Copies from the same negatives were exhibited before the Manchester Geological Society soon after the experiments. I may say that the mine was only four feet high.—Yours truly, Vernon L. Jackson.

2, *Clegg Street, Oldham, December* 13*th*.

[The copies enclosed are very interesting, and, under the circumstances, successful.—Ed.]

CARBON PRINTING.

Sir,—You truly say that many photographers—because photography is their business—think they ought to succeed in any photographic operation at once. Many of us who have tried carbon printing have found this is not always the case; but this arises, I think, in a great measure—not because we have no aptitude to learn, or indeed to succeed experimentally in producing carbon prints—but because we don't know how to set about it *as a business*. Will you allow me to supplement Mr. Robinson's question in your last by asking the Autotype Company, or anyone who is interested in the spread of carbon printing, to give us a full and detailed account of how to fit up an establishment capable of turning out the work required by a moderate business, say from fifty to two hundred or three hundred prints a day; what dishes would be required; what developing tanks, of what they should be made, of what size, and how they should be arranged, and all the little details that contribute so much to success. In the present state of carbon printing, information cannot be too minute. I want to be a worker, not merely A Carbon Experimentalist.

TEMPERATURE IN CHROMOTYPE PRINTING.

Sir,—In reply to the inquiry of Mr. H. P. Robinson in last week's News, I may say that in the letter giving my experience of chromotype printing, I did not pretend to exhaust the subject, but merely addressed myself to what seemed the most important features, and the most frequent cause of failures.

The summer was over when I wrote, and as the season was quite unusually hot, it may be some time before difficulties are to be encountered again from that cause, and although I had met these difficulties and fairly overcome them, I thought that part of my experience could easily wait for expression at some future time.

I am glad to see you have put right your printer's error as to degrees of temperature, and I need not now explain that to Mr. Robinson, but will simply state how I did sensitize the paper during the excessive hot weather, as a contribution towards finding the best method of working the process.

I prepared my solution during the day, and towards evening I stood the bottle containing it in a vessel of cold water and under a tap, which I left partly running. I then, late at night—say between ten and eleven o'clock—proceeded to sensitize the tissue. First, I well sprinkled the floor with cold water, and I used two large block-tin dishes, the outer dish being large enough to allow a small quantity of ice. I immersed the tissue as before described, drew it carefully over the edge of the dish to get rid of some of its moisture, and laid it across pads of blotting-paper to dry. This way of drying is far preferable in hot weather to suspending the tissue by splines, as you avoid streaks and stains. Then my room afforded a very good amount of air, and I had little to complain of. I had considerable orders during the hot weather, and was never brought to a standstill, but, with care and attention, could get my prints done and delivered without unreasonable delay. I have met with reticulation, certainly, but not much of it, and am satisfied careful manipulation will do much to prevent it. I am also informed that the Autotype Company can now prepare tissues not liable to this defect, which, if correct, is a great step gained.

I am a great lover of carbon printing. It gives results quite as good as silver, and they last and never shame the artist. From my own experience, I am satisfied there is a remedy for every difficulty, and that the process will presently be extensively worked.—Yours obediently,

C. J. Witcomb.

Proceedings of Societies.

South London Photographic Society.

The Annual Meeting of this Society was held on the evening of Thursday, December 14th, the Rev. F. F. Statham, M.A., in the chair. The minutes of a preceding meeting having been read and confirmed, Mr. Peter Maudsley was elected a member of the Society.

The Secretary then read the following report, which was duly received and adopted.

Annual Report.

Your Committee, in presenting the Annual Report of the South London Photographic Society for the session 1876, have still to congratulate the members that, notwithstanding the depression which seems to have fallen upon all other matters, the general interest in subjects appertaining to our art-science has not met with a corresponding decrease amongst the members of this Society, save in one particular, viz., the "Technical Annual Exhibition," which, notwithstanding every effort made towards success, has not this session fulfilled the expectations anticipated.

In connection with this, your Committee recognise this important fact, that photography has now become one of the ordinary incidents in every-day life, and must, therefore, be subject to the same influences which act upon all other operations of the human mind; so that they trust the forthcoming year may not only be one of activity generally, but will also be rich in important inventions, both in large and small matters appertaining to photography.

Your Committee are pleased to report that, upon all other meetings of the members, the subjects brought forward have fully sustained the interest and pleasure which have always marked the proceedings of the South London Photographic Society.

Whilst the addition of many new members has strengthened the material position of the Society, they would remind all members that it becomes a duty to communicate to each other the results of observation, and that nothing is too *small* from which to extract something which may possibly turn out to be *large* in its results.

The following papers have been read during the session:—"On Magnitude as an Element of Attraction in Photography," by the President, the Rev. F. F. Statham, M.A., &c.; "On Various Matters connected with Successful Negatives," by W. T. Wilkinson; "On the New Collo-Developer," by W. Brooks; "On the Negative Bath," by W. Gillo; "On the Difference between Carbon and Collodion Transparencies," by W. T. Wilkinson; "Further Experiments with Colloeine," by W. Brooks; "On Obstacles to Photographic Progress," by W. Aldridge; "On a New Application of Sensitive Negative Tissue," by Leon Warnerke;" "The Colours of Photography," by E. Dunmore. Photographs, appliances, and other matters have been exhibited by Messrs. F. Howard, W. Brooks, W. T. Wilkinson, F. York, E. Foxlee, L. Warnerke, J. T. Taylor, J. Werge, W. F. Henry, J. Middleton, and Adam Diston.

In conclusion, your Committee hope that the prestige of the South London Photographic Society will be maintained, not only by increased activity, and possible higher usefulness of its papers and discussions, but, still further, in the direction of more social intercourse and good-fellowship amongst its members.

The Treasurer's report was then read, which showed a balance of £1 18s. 8d. in favour of the Society. The report was received and adopted.

Mr. Wilkinson then, in pursuance of notice, moved that the meetings of the Society should in future be held on the first Thursday in each month, instead of on the second as heretofore. The motion was seconded, and passed unanimously.

The Society then proceeded to the election of officers, as follows:—

President—The Rev. F. F. Statham, M.A.

Vice-Presidents—G. Wharton Simpson, M.A., F.S.A.; John Spiller, F.C.S.; Jabez Hughes; William Brooks; Frank Howard.

Treasurer—Noel E. Fitch.

Secretary—E. Cocking.

Committee—Messrs. Aldridge, Ayres, Dunmore, Fry, Foxlee, Nisbet, Warnerke, York.

Mr. E. Dunmore read a paper "On the Colour of Photographic Pictures" (see page 601).

Mr. Aldridge said that with regard to large portraits, he preferred a warm tone. Mr. Blanchard and M. Adam-Salomon adopted a tone of that kind for their portraits, although it was open to the objection that such pictures were more liable to fade.

Mr. James Tulley considered that professional photographers could not confine themselves to one tone, but must adopt that which best pleased their customers.

The Chairman observed, that there was a certain limit within which the tone was pleasing.

Mr. Hughes said, that the tone of a photograph ought to be selected with reference to the character of the picture: in a sunny, autumnal landscape a warm tone was required; a colder tone being necessary in a wintry scene. In portraiture the same discrimination ought to be adopted. A cold tone would be unsuitable for a blonde complexion, and equally so would a warm, brown tone be unsuitable for a lady in mourning, or a clergyman.

Mr. Dunmore, in reply, said that engravings were always black in tone, and yet they conveyed a correct idea of people of all kinds of complexion.

The thanks of the meeting having been given to Mr. Dunmore for his paper, the proceedings terminated.

In the course of the evening, the Chairman, on behalf of the Society, bid Mr. W. T. Wilkinson good-bye and success in Ceylon, where he was going to take charge of a photographic establishment.

Bristol and West of England Amateur Photographic Association.

The ordinary monthly meeting of this Society was held on Wednesday, 6th inst., at the Museum, Queen's Road, Bristol, Lieut. Lysaght in the chair. The minutes of the previous meeting having been read and confirmed,

Mr. H. A. H. Daniell, for Mr. Webber (who was absent), proposed the Rev. F. T. Salmon and Surgeon-Major Mantell, M.D., both of Honiton, as corresponding members, their election forthwith taking place.

The Chairman then called upon Mr. E. Brightman to read a paper advocating "Intensification of Wet Plates with Iron" (see page 602).

The Secretary then read a communication from Mr. H. Manfield, of Northampton, a corresponding member, in which he advocates the use of iron for intensification for six reasons, viz., because intensification was, with its use, more under control; it gave greater freedom from fog and stains; required much less washing of the plate prior to its use than did pyrogallic acid; the solution improved by keeping, whereas pyro deteriorates; its far less cost than pyro; and its greater portability in a dry form. The writer stated he had entirely discarded the use of pyro as an intensifying agent, and had never regretted doing so. His experience was not so extensive as that of some amateurs, but what he had stated he had found to be the case.

Mr. Brightman handed round some negatives and transparencies intensified with iron.

Mr. Daniel also did so, and remarked that it had been stated that iron had a tendency to "block" the shadows in a negative during intensification; but on that point he was hardly prepared to affirm that, of pyro and iron, either had a greater tendency than the other to do so, but that taking other matters into consideration, he felt that he must certainly advocate the preference of iron, stating that he almost invariably used it till he heard it spoken against; so when going through North Wales, this summer, he used pyro to test the two methods, but found no reason for giving up iron. He differed much from Mr. Manfield on the question of portability, failing to discover that iron was more so than pyro. He exhibited a transparency, one half intensified with iron and the other with pyro, the only apparent difference being a slightly extra degree of softness about the half intensified with pyro.

Mr. Brightman remarked that it was hardly a fair way of testing the two modes, as the character of one-half of the transparency might differ slightly from the other. A stereoscopic picture would be better.

Lieut. Lysaght remarked that he had often found very clearly-shown fine lines in a negative (such as wires or ropes) which he could scarcely detect in focussing, and he always used iron, thereby showing that there was no "blocking" apparent.

Mr. Holt also spoke, strongly urging the claims of iron over pyro.

Lieut. Lysaght then exhibited two negatives by the gelatine emulsion process developed by his new mode, viz., with *hot* solutions, and soaking after using pyrogallic acid on the surface, the full particulars of which appeared in the *British Journal*. He remarked that the sensitiveness was greatly increased, and blisters entirely avoided.

After some further discussion, the meeting concluded with a vote of thanks to Mr. Brightman for his paper, and to the Chairman for presiding.

Manchester Photographic Society.

The ordinary monthly meeting of this Society was held at the Memorial Hall on Thursday evening, the 14th inst., Mr. A. Brothers, F.R.A.S., President, in the chair.

After the routine business,

The Chairman read the following resolutions of the Council:—"That in future the issue of monthly circulars be discontinued, except at the discretion of the Secretary."—"That membership cards shall be issued to those members only who have paid their annual subscription." He (the Chairman) requested all members who had not already done so to hand in their portraits (signed) for insertion in the Society's album.

Mr. James Young showed a plano-concave corrector, and explained its construction and use.

Mr. Pollitt exhibited two photographs by Professor Piazzi Smyth, the inventor of the corrector, in which the advantages of the instrument were fully shown.

Mr. Chilton exhibited an ingenious filter for collodion.

Mr. Leigh exhibited a sample of new grooves for plate-boxes, in which the separating ribs were formed by inserting slips of veneer into saw cuts.

Mr. Leigh said he had attempted, but unsuccessfully, to produce the Beechey rings, as described at the November meeting.

Mr. Woodward handed round some lantern slides tinted with water-colour, as recommended by Mr. Ross.

Mr. Noton read a short paper, with practical illustrations, "On the Reduction of Back Pressure in the Oxygen Machine" (see page 609.)

Mr. Brier showed a new and elegant method of mounting photographs, in which two views were placed with their backs together, between two plates of glass, and afterwards bordered with paper in the same way as in lantern slides.

Mr. Chapman exhibited one of Bateman's metal fires, which Mr. Atherton said was the most efficient stove he had ever had for the dark room. He (Mr. Chapman) also exhibited one of Watson's sciopticons, and which the members tested against one of Woodbury's (the property of the Society); although the same oil was used in the two instruments, the Woodbury disc was of a purer colour. The prevailing opinion was in favour of the Woodbury instrument.

A vote of thanks was passed to each of the gentlemen who had contributed to the evening's entertainment, and the meeting was adjourned.

Talk in the Studio.

Sharpening Scissors.—Mr. F. M. Sutcliffe points out that in cutting and trimming prints with scissors he often finds the use of a common penknife for steeling the blades of the scissors an enormous benefit.

Photography and Etching.—The *Times*, in noticing some recent etchings, thinks it "an anti-climax" to mention photographs in the same paragraph! But it admits that the photographs in question (some by Mr. Vernon Heath) have a grace and dignity of their own. It also admits that "one view of rocks and a burn, with trees here and there jutting out slender branches from the steep sides of the ravine, gives suggestions of grandeur and distance which are rare in any kind of picture." After some further favourable detailed notes, it proceeds:—"But the great value of the photographs is in the step they mark in the progress of the art in respect of enlargement. The picture no longer deteriorates in the process of enlargement, as was once the case. On the contrary, its details come out better; a number of half tones which in the smaller print were undistinguishable to human beings of ordinary powers of sight become revealed, with much enhancement of the softness, richness, and fidelity of the picture. It is the permanent Autotype process, depending upon a film of gelatine, impregnated with any unfading pigment desired, which has made this result possible. The coarse structure of collodion used to spoil a picture which was enlarged, but gelatine may be considered for these purposes to have no visible grain. Mr. Heath obtains from his negative taken in the field a transparency on glass, and from this in his studio a negative of any size required. He then prints directly and without further enlargement from this second negative a picture, which in the examples now under notice is 27 inches by 21. A much greater size is obtainable at will. The field negative from which the smaller prints are taken directly is of about half these linear dimensions, and even with this size it must have been difficult enough to transport the apparatus by the rugged paths of Skye. It was in 1839 that Faraday announced to the Royal Institution the invention of Daguerreotype and aTlbotype. In the thirty-seven years since, so much has been done for the permanence and beauty of sun-pictures that we are entitled to expect still further advances in the art."

To Correspondents.

⁂ The Year-Book of Photography for 1877.—We have again to thank a large number of our friends for interesting contributions to our forthcoming Year-Book, and to ask them to accept this general acknowledgment of the receipt of their communications. Our Annual will be ready in a few days, and will, we trust, be found not inferior in interest to any which has preceded it.

Toner.—The spots on your print are beyond a question due to the bronze powder used in printing the address at the back of the cards. It is marvellous to us that photographers should persist in using cards with the bronze printing after the accumulated evidence which has been published of its mischievous character.

W. K.—A solution of bichloride of platinum, with a trace of nitrate of silver added, is used to blacken the brass-work of lenses. The brass is first made quite clean by washing with dilute sulphuric acid. The platinum solution is then applied; when black enough, the brass is rinsed, and finally polished with black-lead. We have repeatedly given the information in detail. You will find that your wish had been anticipated. There is in the forthcoming Year-Book a series of recipes for this and similar operations.

G. Mancer.—In producing enlargements it is generally found necessary to intensify, as sufficient vigour is rarely obtained with mere iron development. In proportion to the extent of the enlargement the illumination is necessarily reduced, and reducing the illumination materially interferes with the vigour of the image. The difficulty of getting sufficient intensity with iron is one of M. Lambert's reasons for intensifying by attaching a thin translucent paper to the enlarged negative, and intensifying with the pencil. 2. It is difficult to give a precise idea by description of what the transparency should be like. It should be thoroughly exposed, so as to possess all the detail in the negative; but it should not be opaque or dense; it should be well covered with delicate detail, and free from hardness.

Scribe.—Your facilities are certainly very limited; but it is possible that with care and patience you may, for many kinds of work, do very well. With the limited space you describe we should be disposed to make the studio of a lean-to shape, and make the whole of the roof glass. The highest part being ten feet and the eaves six feet, continuing the glass within twenty inches of the ground, the side-light of ten feet, with a roof-light like that we refer to, might do very well. If you make the building ridge roof-shape, we should have glass in both sides of roof, but only on the east side.

F. R. (Soho).—The negatives of cards Nos. 1 and 2 are too hard. No. 1 has been a little under-exposed and over-intensified, and No. 2 slightly over-intensified. The printing of both is pretty good. The exposure, development, &c., of No. 3 is pretty good, and the result is soft and delicate; but it is wanting in artistic qualities. The printing is pretty good. We see no reason why you should not get a position as printer, and, if you steadily improve, as operator. As to what wages you may earn we cannot answer. Living in London you have opportunities of seeing much good work. Steadily resolve to equal the best of it in your own operations, and you will gradually improve your work and your position.

Dragoon.—The camera to which you refer, described in "Cireb's" letter, will be manufactured for sale, and duly announced in our advertising columns.

J. R. L.—Salicylic acid is a pale yellow crystalline powder, of a powerfully antiseptic character, similar in many respects to carbolic acid, but without its disagreeable smell. It is not easily soluble in cold water, but readily dissolves in hot water and in alcohol. It will find many uses in the arts and pharmacy; but many of these are yet the subjects of experiment.

J. S. C.—It is a good thing to filter your printing bath each time it is returned to the bottle, after use. If a little carbonate of silver be kept in the filter paper, the bath will keep clean and free from colour. Kaolin is efficient, but it is troublesome to use. It is a more convenient plan, in many cases, not to return the solution continually to the bottle, but keep it in the dish, carefully covered, of course, to preserve it from dust and evaporating. A strip of paper must, in that case, be drawn over the surface before placing paper on to sensitize. The bath will then only require filtering occasionally. 2. Albumenized paper is best kept in a moderately dry place. If kept so damp as to be sticky to the fingers, it will soon be unfit for use. It must not, however, be "bone dry," as in that state it is difficult to sensitize evenly. The prints to which you refer have not come to hand.

A. B. C.—Hydrochloric acid is better for throwing down the silver from washing waters as a chloride, than common salt. The chief reasons for the chloride not settling readily is that the silver is very small in proportion to the water. Time, and the addition of a little nitric acid, will eventually cause all to settle.

E. C. Wigglesworth.—Many thanks. Referring to the aid to mounting of which you speak, does it answer better than the roller with a handle, like that we described some time ago for aiding in mounting prints in scrap books, &c., as well as on cards?

F. M. Sutcliffe.—Many thanks.

C. C. Sergeant.—The prints have just arrived. We think them exceedingly good, and shall have more to say on the subject shortly.

Syntax.—Your second letter was mislaid last week; or, rather, it was glanced at, as one which had already been answered, from the general resemblance of the diagram to that in the letter we did answer. We have, however, nothing to add, beyond remarking that you have more light than at first we thought, which is a great advantage. The lightness of the rafters, &c., is, we think, an advantage. The plan generally seems very good.

Errata.—In our last week's issue, in Mr. Colquhoun's letter (on page 596) on the negative bath, last line but one, for "often they both work well," read "after bath they work well." Under the heading "In and Out of the Studio," in speaking of photographic societies, that of Vienna, one of the largest associations of the kind, with 276 members, was accidentally omitted, although it was included in the total number. *Humphrey's Journal*, mentioned amongst the American periodicals, no longer exists.

Several Correspondents in our next.

The Photographic News.

Vol XX. No. 956.—DECEMBER 29, 1876.

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A NEW MOIST PRESERVATIVE PROCESS.

In the earliest attempts made to prepare collodion plates at home for use in the field, the aim was not to produce a dry plate, but to prevent desiccation. The introduction of neutral deliquescent salts into the nitrate bath was tried by Messrs. Spiller and Crookes with a view to retard the drying of the sensitive surface for some hours, and the experiment was attended with some success. Other moist preservative processes followed, and for a time honey oxymel, raspberry syrup, and other similar messy substances became the rage. Glycerine was, of course, not forgotten; and probably the best of the moist processes was that published in our pages many years ago, in which glycerine, honey, and nitrate of silver formed the preservative. Glycerine alone, or glycerine diluted with water, has also been found a good preservative for a few hours. In all these cases, however, the wet process was the basis of the operations. At the last meeting of the Photographic Society, Mr. Mawdsley brought before the members a method of preserving moist an emulsion plate by the simple application of a preparation of glycerine, albumen, and water, which appears to possess several good qualities. Indeed, if the use of a moist preservative be accepted at all, this is probably the best that has been proposed.

There are, however, several drawbacks to the use of such plates, which must materially limit the adoption of such a process. One of the serious troubles attending all the sticky processes, discovered early in their history, is the aptitude of the plates to become covered with dust of every kind. Every floating particle in the atmosphere of the dark-room, every loose atom in the plate box, every wandering portion of nomadic matter in the camera, or changing box, or tent, which comes into contact with the sensitive surface, incontinently clings there, and makes its mark in some form. The chief special advantage which this process seems to possess over a really dry plate process, is that the plate kept moist is easily developed with very little water, and that undoubtedly is, under some conditions, an advantage of importance. To a really skilful and careful manipulator, this advantage is less than the drawbacks involved in the sticky surface. It is possible with care to develop a dry plate *en route* with little water, and no considerable waste of time. And if it be necessary to carry bottles and dishes at all, we fancy that the majority of workers would prefer to extend the working facilities, and work the wet process. In fact, if photography be the actual purpose of a trip, we think that a manipulating camera for working small plates with the wet process will generally prove the most satisfactory; whilst if photography be merely an incident of the journey, a means of preserving memoranda of pleasant scenes, then dry plates in the compactest form, and with the least possible impedimenta, will secure the greatest number of adherents. With care a test plate, or even many plates, may be developed in the bedroom of an hotel with little more trouble, and much less risk, than is involved in the use of plates coated with a moist preservative.

EDINBURGH PHOTOGRAPHIC EXHIBITION.

This Exhibition, in regard to which anticipation has run high for some time, was opened by the Lord Provost, Sir James Falshaw, on Wednesday evening, the 20th inst., in the presence of a large assemblage of the *elite* of the city.

The Royal Academy National Galleries, in which the Exhibition is held, having been specially constructed for such purposes, the pictures, of which there are upwards of three thousand, are shown to the best advantage, and presented a very effective display. The contributions have been collected from almost every civilized portion of the globe, so that the Exhibition affords ample and unusual opportunity for comparing side by side the work of various countries, and the style of many photographers. In addition to pictures, the Committee have succeeded in forming a large and interesting collection of apparatus, both old and new, some of it of almost historical interest, such as the camera with which the wonderful pyramid pictures of Professor Piazzi Smyth were taken. We understand that the Exhibition has already been visited by a considerable number of well-known photographers from all parts of the country, and all express themselves surprised and gratified both with the quantity and quality of the contributions displayed. The Exhibition may without qualification be pronounced a success.

The pressure upon our space this week forbids the insertion of any detailed notice, either of the general collection or of the individual contributions; but we hope to return to the subject in our next.

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PHOTOGRAPHING MUSICAL TONES.

One of the latest novelties in applied science, the *Daily News* remarks, it seems, is to photograph musical tones, and in this way to record by light sounds that are usually apparent only to the ear. The art of photography has already worked so many wonders that few probably will be astonished at any further feats it may be able to accomplish. At Greenwich for a long time past the magnetic pulsations of the earth have been automically written down by that most faithful and trustworthy of clerks, and at the Kew Observatory we hear of daily records being secured of the sun, whenever that of late rather bashful luminary can be prevailed upon to show its face. The movements of the barometer and thermometer are also noted nowadays by the retina of a sensitive plate, and doctors may employ the same infallible and sharp-eyed tell-tale to register the pulse-beats of their patients. It is, perhaps, only in the natural course of events, therefore, that notes and sounds should be found capable of being written down by the same wonderful agency. Dr. Tyndall showed us some years ago how flames were influenced by sounds uttered in their immediate neighbourhood, and how they were capable of appreciating various intonations in a very marked degree; indeed, if we remember rightly, one flame that he exhibited was so sensitive that, like a delicate-minded person, it invariably went out when some particular word or vowel was mentioned. M. Koenig, of Paris, has already essayed to record by photography the change that overcomes flames from this cause, but a German physicist, Dr. Stein, has successfully accomplished the "photography of tones" by a much more direct method. His plan, it appears, is simply to fix upon a violin string an upright disc or screen of mica, with a hole in it. A brilliant ray of light is made to pass through this little hole on to a sensitive photographic plate, which moves along at a rapid pace. Of course, if the disc and the tiny orifice in it remain perfectly stationary while the photographic plate is moving, all that will be produced in the end upon the plate is a long and even line, where the ray of light has acted. But as soon as the string vibrates —as soon, that is, as the violin bow is drawn across it— the little disc also trembles and vibrates, moving up and down with great celerity, and the ray of light reflected upon the photographic plate behaving in a similar manner, a curved line is the result; and the number of these curves denotes the number of vibrations, which are thus made visible and so easily counted. All ordinary musical tones, it is said, can be photographed in this way, and Dr. Stein has been able to register several tones together, by fixing the discs attached to a series of strings like those of a violin, one above another, so that four curved lines are written down at once.

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PHOTOGRAPHY AND ASTRONOMY.

BY M. J. JANSSEN.*

As we have said, the solar spot is a photographic phenomenon—a disturbing phenomenon, indeed—in the highest point of the region where it is produced, and for this reason it is that the ordinary aspect of the photosphere is modified all around it. Moreover, if the spot is sufficiently distant from the centre of the disk, it should present the perspective effects of an object placed upon the tapering surface of a globe. Finally, it is necessary to pay attention to the solar region where the spot is seen, to see as far as possible what is its solar latitude, since it is well known that the spots have two regions of election, north and south of the equator of the luminary. Here, therefore, we have an *ensemble* of conditions which permits a skilled and practised observer to pronounce in a few moments upon the true character of a spot. But it is of much more value still to know of the proper movement of a body interposed, seemingly, against the granulations of the solar regions upon which it is projected.

It is evident that a body interposed between our eyes and the solar surface must produce a succession of eclipses of the granulations, covering successively those towards which he moves, and uncovering those on the opposite side. This phenomenon of successive emersions and immersions is the most decisive of all those which can be invoked when it is a question of an observation which can endure but a few instants. It requires, it is true, a good instrument, and a power sufficient for the purpose; we may remark that observations made with very low magnifying powers should be taken with extreme reserve, by reason of the impossibility of the observer to state the true character of the phenomenon. I except, of course, such an observation when one has the good fortune to observe an entrance and an exit.

I may give one word of advice to observers, and that is to search with the greatest care the regions around the solar disk up to three or four minutes of angular distance; at this interval the coronal atmosphere still gives a strong enough light for an object interposed even for a fraction of a second to create a visible eclipse. In Japan I saw the pale disk of Venus detach itself from the coronal atmosphere some time before it entered the solar disk. If an observer is witness of this phenomenon—that is, either of an entrance or exit—he gives to his observation the stamp of accuracy, for this circumstance is of course absolutely irreconcilable with the hypothesis of a solar spot.

It must be pointed out, moreover, that this property of the coronal atmosphere enlarges by one half the field of observation, and that it permits us to bear witness of the passage of a body before the sun, even when this body only passes for a few minutes along the limb.

These are some of the remarks which I think it incumbent on myself to make in respect to observations made by means of optical instruments. I believe that if we discussed from this point of view the observations of passages which are recorded, many of them would have to be eliminated. But I do not insist upon this point, because the intervention of photography may permit us to regard the question from a totally different stand-point.

In fact, ocular observations are, at the best, isolated observations. On the one hand, the occupations of astronomers, and on the other the fatigue and danger attending long-continued observations, are reasons which will always be opposed to the sun being followed in different parts of the globe with sufficient assiduity to be assured, as I said at first, that nothing escapes the eyes of the observers.

Photography, however, gives us to-day images of the sun in such perfection that they permit us to employ them in work of the greatest precision. A photograph of a passage, if made with a suitable instrument, carries on the face of it an impersonal character, and one of authority, which, moreover, offers for purposes of measurement and examination such previous details that they surpass in value the observations of the most skilful astronomer. This fact, which I have felt for some time, was pointed out, in fact, twenty years ago to the Academy of Sciences by my eminent colleague M. Faye, and I myself have organised a system of celestial photography at the Astronomical Observatory, which the Academy has done me the honour to confide to me.

As regards the sun, the photographs produced are the annals of this year's luminary, whose history is about to be written. The question of intra-mercurial bodies show at once the immense importance of having a long series of those documents recorded by international concert. But as to the special question which occupies us, it will be seen to be necessary to obtain images taken at intervals sufficiently close, so that no passage could possibly occur without being registered. In this case the *revolver photographique* appears to me to be particularly suitable for giving a solution of the question. An instrument of this kind, which carries a dry plate, and which is of such a nature as to be capable, for instance, of taking a photograph every hour, permits the securing of solar images to be developed subsequently, without fatigue and without requiring the assistance of an observer or manipulator of any sort. A certain number of those instruments distributed systematically over the globe would furnish superabundant pictures for the purpose required. Under these circumstances the circumsolar regions would thus be explored with a certainty and efficacy which it would be impossible to obtain by any other method.

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ON PHOTOGRAPHIC OPERATIONS IN THE RECENT ARCTIC EXPEDITION.

BY CAPTAIN ABNEY, R.E., F.R.S.*

On the return of the Arctic expedition, I wrote to Sir George Nares, suggesting that a report of the photographic operations undertaken by his staff would be very useful as a guide to the equipment of other similar expeditions. I was personally much interested in the success of the photography, as to me was entrusted the fitting out of both ships with the needful supply of apparatus and chemicals, and also two officers and two men (amongst whom I believe was Gunner Porter, who succumbed to the climatic influences) were sent down to Chatham to be instructed. Having had the benefit of Lieutenant Chermside's experience, I had impressed on these photographers the importance of being able to manipulate dry plates, and Paymaster Mitchell and Mr. White will be seen from the context to have profited by that advice. At the same time the practicability of working wet plates must be admitted as beyond dispute, and for this process ample means were provided.

When Captain Nares wrote to me before the expedition started, he told me that the whole outfit must be as small as possible, as there was literally but small space in which to stow it. This being the case, 6½ by 8½ plates were selected as the size of negative, and the whole equipment was arranged accordingly. The feature of it I wish to bring to notice, namely, hot-water tins in which to immerse the silver nitrate bath. The North American Boundary Commission, which consisted principally of Royal Engineers, took a large photographic equipment with them, and amongst it these hot water tins. The report on the subject of the utility of these is most satisfactory from the last party (who had to endure a greater degree of cold in Canada, more than the Arctic expedition), and I believe it will be found that the Arctic expedition will recognize the same as having these most useful adjuncts. Mr. Baden Pritchard gave every help to the expedition as far as photography was concerned, and it is a matter of the greatest satisfaction to himself and myself that results obtained in it have been so full of promise.

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* Continued from page 545.

* Read before the Photographic Society of Great Britain.

Thinking that a preliminary notice of the methods employed might be interesting to the meeting to-night, I wrote to Mr. Mitchell to ask him to give me any details he might see fit pending the official report. In reply, this gallant officer wrote me a letter from which I have taken the liberty to make copious extracts, thinking that the words of the photographer himself would be much more expressive than any I could say for him.

I am sorry Mr. Mitchell and Mr. White are not here to-night, but a meeting of the Geographical Society has unfortunately prevented their attendance. I had also hoped to get a few photographs to exhibit, but owing to these not as yet being published I was unable to obtain them.

I cannot do better than quote extracts from Mr. Mitchell's letter to me, to show you what were the conditions under which he worked. He says :—

"During the passage from Disco to winter quarters, I did not lose an opportunity of making photographs night or day. Many were taken about midnight. The only place I had to work in was my cabin, which, as you must know, was not very large, and consequently not convenient. The water supply was necessarily small, and not by any means good. Printing was consequently not attempted.

"I used the wet-plates and the formulæ as at Chatham in preference to dry plates." . . . . . "I was much troubled with pinholes in the wet-plate negatives, dust also was a constant source of annoyance. I seldom had more chances than one, so that the first photograph was, as a rule, the final one.

"Although the temperature during the navigable season was low (a few degrees below freezing) the exposures were very short, seldom over thirty seconds even at midnight in the month of August, and often only five seconds.

"The difficulty in the exposure was to give sufficient time for dark objects to come out. The ice and snow reflected so much light, that two or three seconds would suffice for them, whereas for the ship or the dark-reddish background of hills and land a much longer exposure, twenty or thirty seconds, was needed. If the exposure were prolonged, the ice invariably came out with absence of all detail, and the resulting negative was useless."

This experience of Mr. Mitchell's of course coincides with that of all workers in cold climates where ice and snow abound, and Arctic photography on that account must always be a difficulty. Mr. Mitchell then proceeds :—

"The winter came on quickly, and the photography ceased from want of light. Towards the spring dry plates were prepared with Liverpool emulsion and your albumen beer plates. I worked very hard with the emulsion plates, and found them very quick indeed, five seconds in bright sunshine in the coldest weather, but I did not consider them satisfactory as I thought them weak. The near and dark objects came out the best.

"I used the albumen beer plates when I wanted to make certain, and found them generally to answer very fairly; they too were weak, but I attributed that to the great strength of the albumen beer used in their preparation. When going up to the 'Alert' I took the camera and three albumen beer plates with me. They all came out, and are preserved, fifteen seconds' exposure with temperature between — 20° and — 30°.

"A very passable negative was made with an albumen beer plate a week before the sun rose, the lens faced the south at noon, and with thirty minutes' exposure a negative of the ship and skating rink, &c., was taken; the temperature at that time was — 46° (or 78° below freezing point). The ship was photographed on the 6th of March, a week after the sun rose, with an albumen beer plate, temperature — 64° (or 96° below freezing), exposure half an hour, and a bright sun shining. It was unexposed, but not sufficiently to spoil it.

"In May I left the 'Alert' with an exploring party to the northward, taking with me a few plates prepared by Mr. White with the gum gallic process, but they came out terribly spotted in the sky. They are, however, preserved.

"Mr. White was successful with dry-plates with the tea preservative.

"One day, being in a hurry, I sensitized the plates, and after washing them well, put them in a slide, carried them six miles, and photographed the coal seam at Discovery Bay. On my return to the ship I dipped them in the bath and developed as usual for wet-plates. One came out very fairly, considering that they only took their chance of drying in the slide during the walk.

"My great difficulty was with the water; in the early spring nearly all I used I was obliged to obtain from melted snow, and even that used to contain some chlorides, even when obtained some short distance from the sea.

"Taking all our difficulties into consideration," he concludes, "I think that on the whole we were fairly successful. Of course they would not pass muster if seen in England. I found no difficulty with wet-plates at —40° (or 72° below freezing), provided I had not far to carry the plate from the ship, as the exposure was short and the slide could then be previously warmed, and then well wrapped up."

With too much modesty he says, "I do not think I could write a paper on the subject, being a *very small amateur*, especially as I am not altogether satisfied with my own productions."

I think, gentlemen, that we have learnt something from this outline, which is, that the wet man and the dry man can both succeed in the production of pictures in the most intense cold. We are most of us not likely to meet one difficulty Mr. Mitchell met with, viz., in being unable to photograph at mid-day owing to the absence of the sun below the horizon, though we may be called upon to take photographs at midnight in regions which are habitable. I should imagine that the photograph taken at 96° below freezing is a curiosity, being probably the only one ever taken at such a low thermometric reading; and I am happy to think that the albumen beer process did not fail under such trying circumstances.

I see allusion is made to the tea preservative. It has been a great favourite of mine, and I believe that pictures taken by it within twenty-four hours of preparation can be fairly compared with the best wet-plates, but my experience is that they will not keep. It will be a matter of some curiosity for me to learn if these plates were exposed after long keeping, as, if so, it proves that cold is favourable for even the most unstable of dry-plate processes.

In a letter I had from Sir George Nares, he tells me that he is making a report from nature of his expedition. This will consist of photographs taken from the untouched negatives, and signed by him as such. From what I can gather, these will be printed in a permanent process, and will therefore be interesting relics of the expedition in time to come. Rich in scientific work as this expedition has been, and great as has been its success in every way, except in the absolute attainment of the pole, it has also taught us photographers a lesson—that a little tuition, and plenty of energy and brains, will allow mementoes of difficult and dangerous expeditions to be secured by means of the camera.

A NEW AND SIMPLE METHOD OF WORKING IN THE FIELD.

BY PETER MAWDSLEY.*

A VERY common, and, in fact, the strongest argument advanced by the advocates of wet collodion in the field against the use of plates prepared at home is, "Oh, we like to see what we have got, and by using wet collodion we can insure good results." In reply to this I might say any experienced dry-plate worker having plates, lens, &c., that he is accustomed to work with, and the conditions of light and subject being favourable, can, though lacking proof whilst out, be equally certain of producing good results when developing his negatives comfortably and leisurely at home in his dark room; however, it is not now my business to argue as to the merits of wet or dry collodion, but to describe a method by which, with ready sensitized plates and very little more impedimenta than the dry-plate worker usually carries, the said plates may be developed on the spot. I use emulsion plates washed and flowed over with a mixture of glycerine, albumen, and water; the proportions will vary according to circumstances, thus:—

If the plates are meant to be exposed and developed within a short time the following will answer perfectly:—

Glycerine	1 ounce
Albumen	1 ,,
Water	20 ounces

but if, on the other hand, the plates are required for long keeping I should increase the quantity of glycerine and decrease the water. I have brought some plates with me, for the purpose of developing them before you, which have been prepared three weeks and one week respectively—in a perfectly tight box I should not hesitate to keep them twelve months, or send them on a voyage to India, having every confidence that they would give good results when used; the preservative was:—

Glycerine	2 ounces
Albumen	1 ounce
Water	6 ounces

As for the emulsion to be used, any good sample will do, that is to say, what will do for dry plates will answer equally well for moist, nor is it material whether the emulsion be such as has been washed, dried, and redissolved, or that which contains soluble salts, inasmuch as washing is required in both cases. A hint here on the subject of washing will not be out of place, and may be useful to some; I frequently see it recommended to wash under a tap or from a jug—well, one pint of water in a dish or bath will more effectually do the preliminary washing than twenty pints from a tap, and for this reason; if placed in a dish, the ether and alcohol become absorbed by and diffused through the water; more than that, the alcohol having so great an affinity for water will absorb some into the film itself, and thus prepare it for a final wash under a tap, whereas if the plate, soon as the film has set, be placed under a stream of water, the water will be repelled almost as fast as it is poured on, and for some time it would appear to be of as much use to attempt to wash a piece of tallow,—by the way, I prefer to use distilled water for the first wash and final rinse before applying the preservative, which latter I do by taking the plate on a pneumatic holder and flowing a little over the surface from any suitable vessel—a very little suffices; let the excess go into the sink, then stand the plate up to drain, face inwards, each successive plate resting against the back of previous one. When all are done store them away in a suitable box till wanted. I have with me a box, which I use for the purpose of containing the plates I shall develop this evening, and also the unfixed negatives, all of which were exposed on Saturday. I had waited all the week for a chance of doing so, and as I had many experiments to make I cut down the exposure, as my only object was to demonstrate my method without desiring to have fully exposed negatives; this I need scarcely ask you (experienced photographers) to make due allowance for. I have plates of two degrees of sensitiveness; of the more sensitive kind I have only one, as I fear, with the light I shall have to work by here, there will be probability of fog. The sensitiveness I have tested to be twice to three times greater than that of a wet plate with bath and chemicals in fair working order, hence great care is necessary in the manipulations. I develop thus:—

Flush the surface with—

Saturated solution of carbonate of ammonia ...	1 part
Water	1 ,,

and return to bottle; then, having poured sufficient of an 8-grain solution of pyro. into a developing cup, I complete the development with same, using, if necessary, a few drops of a 10-grain solution of bromide of potassium added to it as a restrainer. When details are well out I flood the plate with water, acidulated with acetic acid, just so much that its presence may be detected by the smell; this wash effectually neutralizes the ammonia and stops action of developer. The negative may now be stowed away until it be convenient to fix and complete.

I like to finish off with acid pyro., to which a drop or two of a 20-grain solution of nitrate of silver has been added; this, however, may be done at any time, if correctly or under-exposed, *before* fixing; if over-exposed, *after* fixing. In any case, before applying the acid pyro. and silver, I flood the surface with the acidulated water before mentioned. I need scarcely say that the novelty and simplicity claimed in the title of this description does not include the preparation of moist plates—it is probable such had been made before my advent in photography. What I claim is a new and simple method of developing in the field without water; half a pint of solutions will suffice to develop a dozen plates of the size I use, 8 by 5. I place before you on the table one 2-ounce and two 6-ounce bottles—all that are required for the purpose; as for the tent, that known as "Howard's," or a Stillman's changing and developing box, would probably answer as well as any, and their weight would be a mere trifle.

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Correspondence.

CARBON PRINTING.

SIR,—In your last, "A Carbon Experimentalist, who wants to be a worker," wishes to know from "the Autotype Company, or anyone who is interested in the spread of carbon printing, as to how to fit up an establishment, &c., for the work." May I suggest that "A Carbon Experimentalist" is beginning at the wrong end by attaching value to such information. He should first well ground himself in sensitizing the tissue properly, in drying it, in the right use of the actinometer in printing, in developing, and in transferring. If he will take the pains to master all these points so that he can produce carbon prints as good and as uniform as silver ones, and with as little waste, he will be more profitably employed than bothering himself about the number and size of his tanks and dishes. By the time he has acquired this skill he will have found out for himself the number and size suitable for his own business; and until he acquires this ability the tank-and-dish knowledge will be but of little use to him. There is no more common agreement among carbon workers as to these details than there is among silver workers. Everything that is essential for working is contained in the "Autotype Manual."

I would suggest to "A Carbon Experimentalist," and to all who, like him, are anxious to adopt carbon printing as a business, not to fritter time away in the vain hope that by writing anonymous letters he can "pick up" the practical information he needs. Let him do as Mr. Witcomb and others have done—go to head-quarters, pay an hone or instruction, see the work done, and thus learn how to do it himself. This is the way that I became

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* Read before the Photographic Society of Great Britain.

A Successful Worker.

EARLY PHOTOGRAPHY IN BRISTOL.

Sir,—Could any of your readers who are well acquainted with the early history of photography inform me who was the person who in the year 1843 or 1844 had a photographic studio, and practised the Daguerreotype process, in part of a building opposite the Clifton College, at Bristol. The building (a temporary one, I think) was used at one time for a Polytechnic Exhibition, and part of it was used (at the time the photographic studio was there) as a gymnasium under the superintendence of a Dr. Hartnell. I should be much obliged if anyone could give me any information on the subject.—I remain, sir, yours faithfully,

H. Anderson.

DISCUSSION ON CARBON PRINTING.

Dear Sir,—The Council of the Photographic Society of Great Britain, having arranged that a discussion on Carbon Printing (to be opened by Mr. S. Fry) shall take place at the next meeting, on Tuesday, January 9th, at 5a, Pall Mall East, it is requested that members and others who have had any experience in this matter will kindly attend, and take part in the discussion, as the occasion will be most interesting, the subject being of paramount importance.—Yours faithfully,

Edwin Cocking, Assistant Secretary.

Talk in the Studio.

Mr. Spencer and the Autotype Company.—The rumour which has been circulated amongst London photographers during the last few weeks, as to the retirement of Mr. Spencer from the Autotype Company, receives confirmation from Mr. Spencer's announcement in our advertising columns to the effect that he has sold his interest in the Company to his partners, Messrs. Sawyer and Bird. It is gratifying to announce that the employes of the Company testified their cordial goodwill to Mr. Spencer, by presenting him with a handsome microscope, and an inscription duly illuminated on vellum, expressive of their esteem, as a parting testimonial.

South London Photographic Society.—At the next meeting of the Society, on Thursday, January 4th, at the rooms of the Society of Arts, Adelphi, the session for 1877 will open with a "Popular Meeting," when a lantern exhibition will be given, affording an opportunity for members to exhibit transparencies of their own making.

The Prince in India.—Messrs. Marion and Co. are just publishing an extensive series of photographs illustrating the progress of the Prince of Wales in India, with descriptive letterpress. The whole forms a handsome volume selling for ten guineas.

Photo-typography.—An exceedingly fine example of photographic reduction by the combined aid of photography and the electrotype, has just been issued by the proprietors of the *Glasgow Herald*. It is a copy of a page of their evening issue, *The Evening Times*, reduced to one-twentieth of the ordinary size. Although so minute it is beautifully clear, and may be read without difficulty by good eyes in a good light.

A New Theory of the Laws of Light.—We learn from *Bell's Messenger* that the Rev. Percival J. Brine, one of the Senior Fellows of King's College, Cambridge, is about to publish another series of photographic illustrations of the doctrines he seeks to establish in regard to the relations between light and its reflection. His main object is to prove that the prevailing mode of measurement by the sextant cannot always be depended upon for coast lines and marine distances, and that disasters by sea are the frequent result.

Light.—Professor J. Dewar lectured on Monday evening at the London Institution on "Light and the Eye." The first experiment shown was the effect of light on two plates of metal coated with chloride of silver, and arranged to show the electric effect by the action on the galvanometer. It was this arrangement devised by Professor, now Mr Justice, Grove, that led Professor Dewar, in connexion with Professor T. G. M'Kendrick, to take up the subject. The experiment showed that the electric effect of light was great, the reflection of the galvanometer indicating that beyond the usually recognized photographic effect there was a decided electrical effect. The question what kind of light produced this effect was then considered, and coloured lights were used on the plates. Red, which has a small photographic effect, was shown to have a small electric effect, while violet and ultra-violet, which have a large photographic effect, had a great electric effect.

Pirating Works of Art.—At the Brighton Police Court Mr. Benjamin Brooks, fine art publisher, of Oxford Street and Great Portland Street, London, prosecuted a local bookseller and dealer in prints, named Edgar Swane, carrying on business in a leading thoroughfare, near the railway terminus, to recover six penalties of £10 each, for selling pirated photographs of the popular engravings, "Grace Darling" and "The Reaper." Prosecutor, who appeared to conduct and prove his own case, said the prosecution was under the 6th section of the Copyright Act (Vic. 25, 26, c. 68), and he had felt compelled to initiate the proceedings owing to the great and perpetual injury inflicted on him by dealers selling such photographs. He had in 1870 given £1,000 for the copyright of "Grace Darling," and pirated copies were being sold far below the cost at which they could be legitimately produced, a print being sold for 6d. which he, who held the copyright, could not sell for less than eight guineas. The number of the photographs sold was very large; in fact, defendant's wife had herself said she could not obtain them fast enough. They were prepared in Boston, America, and were distributed over this country by Jew pedlars at, perhaps, a penny each. A case concerning the same picture was tried in London in 1870, when there was a conviction; and lately the injury inflicted on him had grown to such proportions that he had decided to again prosecute as a warning to others. With this view, he would consent to a penalty in a single case. The Bench accordingly convicted defendant on one charge only, fining him £5 or a month's imprisonment; and, as a return for prosecutor's leniency, defendant promised to give up the names of the parties who supplied him with the illegal copies.—*Daily News.*

Silvering Mirrors.— A correspondent of the *Scientific American* recommends the following process for silvering mirrors:—"Having had occasion to silver some small plates of glass, I tried several formulæ, and found that the following works very finely, giving a heavy deposit by a single application:—No. 1. *Reducing Solution*: In twelve ounces of water dissolve twelve grains Rochelle salts, and boil. Add, while boiling, sixteen grains nitrate of silver dissolved in one ounce water, and continue the boiling for ten minutes more, then add water to make twelve ounces. No. 2. *Silvering Solution:* Dissolve one ounce nitrate of silver in ten ounces of water; then add liquor ammonia until the brown precipitate is nearly, but not quite, all dissolved; then add one ounce alcohol, and sufficient water to make twelve ounces. *To Silver.*—Take equal parts of Nos. 1 and 2, mix thoroughly, and lay the glass face down on the top of the mixture while wet, after it has been carefully cleaned with soda and well rinsed with clean water. Distilled water should be used in making the solutions. About two drachms of each will silver a plate two inches square. The dish in which the silvering is done should be only a little larger than the plate. The solution should stand and settle two or three days before being used, and will keep good a long time."

Filtering Papers.—What is claimed as a new way of making filtering papers has been introduced at Paris. The filter is made from a square piece of paper folded at first so as to make a crease at each angle. This is done in two folds; while still triangular in shape, it is folded in creases parallel with the edges, and is then opened out, and commencing at one corner, is again folded so that the creases converge, repeating the operation from each corner, the result being a circular filter, with rigid or corrugated sides presenting a larger surface than the ordinary circular filter. This does not appear to us to be new.

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of the Photographic News v
which will contain four pages ex

*** The Year-Book of Photography for 1877 will be ready in a few days. Besides the calendar and usual information, it will contain an unprecedented number of original articles by the most distinguished photographers. Amongst others will be found contributions from Messrs. Adam-Salomon, Dr. Diamond, Dr. Anthony, H. P. Robinson, Valentine Blanchard, J. H. Dallmeyer, Captain Abney, Col. Stuart Wortley, R. Faulkner, W. Mayland, Jabez Hughes, O. G. Rejlander, Alfred Hughes, Dr. Vogel, Dr. Van Monckhoven, Dr. Liesegang, J. R. Sawyer, Vernon Heath, J. W. Swan, J. Werge, C. Ferranti, Dr. Phipson, H. Cooper, W. Woodbury, Warwick Brookes, H. J. Burton, Bedford, Pritchard, Neilson, Penny, Foster, Mitchell, Eliot, Bottone, Dr. Mantell, Nesbitt, Watson, Cherrill, Col. MacMahon, Bovey, Batho, Captain Waterhouse, Cowan, Ainaud, Atkinson, A. Brothers, F. York, T. Gulliver, Captain Turton, C. Waldack, W. Brooks, J. Chaffin, Ayres, Brier, Ford Smith, Tagliacozzo, Tudor Williams, A. Johnston, T. Sius, G. W. Houghton, Vernon, Lochlomond, Burgess, Grant, Viles, Eve, Harman, Norman May, Stenning,, Photo-Chemicus, Frank Dore, S. Bone, A. Greiner, J. Martin E. T. Rolls, J. H. Whitehouse, Piquepe, J. W. Stow, J. C. Fuller, N. Pepper, R. Murray, R. Parr, A. H. Bool, Sutcliffe, Hardwick, Smartt, Hance, Williams, Baynham Jones, Borland, Cireb, Sydney Smyth, Witcomb, Bradshaw, Kennett, Croughton, Ferrara, Richardson, Young, Brown, Rees, Wigglesworth, Tulley, Greaves, Barker, Hackett, C. Lea, Wane, Lewis, T. Tedrake, J. A. Spencer, Fitzgibbon, Beasley, and many others. The Year-Book will also contain a fine print by the Photo-collographic Process, executed by Mr. A. Pumphrey, of Birmingham.

Experimenter.—Thanks. We shall take occasion to try the collodion when the weather and light will permit of efficient trial or experiment.

R. T. W.—Copper or brass is the best material for the worm of a still. The soft white metal tubes are not to be trusted.

D. D. (Belgian subscriber).—Many thanks. The honey and glycerine preservative for keeping plates moist was first published by Mr. V. Blanchard in the Year-Book for 1863, page 82. It underwent many modifications, but not improvements, nothing better answering the purpose than the original formulæ. That has, however, been superseded by modern methods much simpler and more rapid. The method described in the present number by Mr. Mawdsley will be found much more simple, and is very efficient. 2. The No. 1 B lens may, without difficulty, be screwed and used with the camera you describe. 3. For landscape pure and simple, the wide angle single you name will answer as well as any. If, however, buildings, or any objects demanding strictly straight lines, are included in the picture, the rapid rectlinear of the same maker will be better.

G. Webber, jun.—The portrait submitted to our inspection is unquestionably susceptible of further improvement by the hand of a skilled artist. The head is really well painted, being manipulated with great care, and showing a fine feeling of the tone of flesh, but its good qualities are seriously marred by want of concentration in the picture, the whole of the lower portion of which is too light and prominent. The black trousers (which look like light grey) want toning down considerably. The hands, too, are far too pale and prominent, giving the picture a "spotty" look, and quite destroying breadth. They catch the eye, in fact, before the face is seen. The hands, trousers, and the whole of the lower part of the picture, require to be subordinated to the head, instead of, as at present, distracting the eye and destroying the harmony of the picture.

J. S. C.—No prints have yet come to hand.

B. F.—You will find several articles referring to photo-collography in our forthcoming Year-Book. A new and simple method is described by Captain Waterhouse.

G. L. D.—Enamelling should have the effect of preserving a print from fading, as, no doubt, it really does, provided the print is carefully fixed and washed. Of course, if these processes have not been efficiently carried out, neither enamelling nor applying encaustic paste will be of much service.

ere is no photographic operation
experience than the production of
of vital importance. It should be at
course, a good process is of im-
perience are far more important. A
If it be thin and grey, it will be
process, to secure sufficient deposit of
d blacks. And if the brilliancy be
gained by too much intensifying, it is difficult to carry the substitution process right through the deposit of silver; and if any silver be left, either unchanged in the toning or substituting process, or in the shape of chloride, it is apt to spoil the tone of the whole. The flux is best applied in collodion. Nothing but experience will serve you in firing. If you do not fire enough, the picture is not uniformly glazed, and is not of the right colour. If you carry the firing too far, you are apt to lose all vigour.

W. Colquhoun.—Many thanks.

C. Ferranti.—Thanks. In our next.

Several Correspondents in our next.

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METEOROLOGICAL REPORT FOR NOVEMBER.

BY WILLIAM HENRY WATSON, F.C.S., F.M.S.

Observations taken at Braystones, near Whitehaven,
36 *feet above sea-level.*

N.B.—Barometric readings not reduced to sea-level. Temperature in the shade.

Date.	Barometric Pressure. Morning	Noon.	Night.	Temperature Morning	Noon.	Night.	Remarks.
1	30·20	30·20	30·16	30°	42°	42°	Fair, and bright
2	30·12	30·12	30·06	46	43	48	Fair, and bright
3	29·93	29·97	29·93	51	51	51	Rain p.m.
4	29·94	29·92	30·19	51	54	54	Fair, but gloomy
5	30·10	30·09	30·05	52	52	51	Showers p.m.
6	30·10	30·12	30·08	48	48	37	Fair and clear
7	30·09	30·10	30·10	34	44	34	Fair and sunny
8	30·04	29·98	29·94	34	44	33	Fair, clear, and sunny
9	29·89	29·90	29·95	32	37	34	Fair and sunny
10	29·99	29·99	29·99	26	35	33	Fair and clear
11	29·73	29·63	29·50	34	40	36	Fair, but gloomy. Strong wind
12	29·39	29·20	29·19	40	46	43	Rain a.m. and p.m. with strong wind
13	29·30	29·38	29·40	44	45	43	Rain p.m.
14	29·39	29·24	29·23	45	52	52	Rain a.m. and p.m. Strong wind
15	29·21	29·29	29·40	50	54	48	Fair and clear
16	29·31	29·15	29·18	50	55	54	Sunshine and showers a.m. and p.m.
17	29·40	29·55	29·69	52	54	49	Fair and sunny
18	29·70	29·70	29·50	49	51	50	Rain a.m. and p.m.
19	29·49	29·49	29·33	47	49	47	Showers a.m. and p.m.
20	29·54	29·64	29·80	44	47	39	Fair and clear
21	29·90	29·93	29·98	43	45	43	Fair, clear, and sunny
22	29·99	29·97	29·95	44	44	39	Fair, but gloomy. Strong E wind
23	29·96	29·85	29·77	39	39	38	Fair but gloomy
24	29·66	29·65	29·60	38	40	41	A little rain a.m. Gloomy and windy all day
25	29·41	29·28	29·20	41	43	42	Rain p.m. Gloomy all day
26	29·29	29·29	29·30	42	42	45	Rain a.m. and p.m.
27	29·14	29·10	29·15	42	44	37	Fair, but gloomy
28	29·19	29·21	29·25	32	39	35	Fair and sunny
29	29·27	29·31	29·41	37	44	33	Showers of hail and rain a.m. and p.m.
30	29·41	29·05	29·43	33	44	43	Fair, but gloomy. Windy at night

Summary.

	Mornings.	Noons.	Nights.
Highest temperature observed	52° ...	55° ...	54°
Lowest ditto	26 ...	35 ...	33
Mean ditto	42 ...	45·7 ...	42 5

Mean of all observations	43°·4
Number of fair days	18
Number of days on which rain fell	12
Number of fair days clear	11
Number of fair days gloomy	7

Note.—From the foregoing the reader will see that during last month we were favoured with 11 bright days out of the 18 total fair days. It is, perhaps, needless for me to add that that is a proportion larger than we generally have in the month of November. So far (December 12) the weather keeps very mild, the thermometer being generally at 48°, and we find in the fields daisies almost as prevalent as in the earlier months of the year.

Braystones, near Whitehaven, December 12, 1876.

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PHOTOGRAPHS REGISTERED.

Mr. W. H. Duoan, Southsea,
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